European Foundation
for the Improvement of Living and
Working Conditions

Papers presented at the

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on

MONITORING THE WORK ENVIRONMENT

15-16 November 1990
Dublin

SYSTEMS FOR THE MONITORING OF WORKING CONDITIONS RELATING TO HEALTH AND SAFETY

Papers
presented at the Conference

European Foundation
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CONTENTS

Preface

Through the preparation of the Foundation's "Catalogue of Systems for Monitoring Working Conditions related to Health and Safety in the European Community" a large number of instruments were identified.

In order to illustrate the variety of relevant monitoring systems and in order to prepare a discussion on a better integrated Monitoring System in Europe a few of the identified monitoring instruments were selected for a presentation at the "Conference on Systems for Monitoring Working Conditions related to Health and Safety in the European Community".

We would like to thank the speakers for their presentations and their very interesting papers included in this document.

Pascal Paoli
Research Manager

Henrik Litske
Research Manager

PROGRAMME

Thursday 15 November 1990

13.30 **Opening**
Clive Purkiss, Director, Foundation

13.45 **FIRST SESSION:**
Descriptions of existing monitoring systems in the Community and outside

Chairman: Tom Walsh, Director, National Authority for Occupational Health and Safety, Dublin

13.50 **Presentation of Foundation catalogue: uses; updating**
Henrik Litske, Research Manager, Foundation

14.25 **Product registers**
Ole Honoré, Director The Danish Product Register, Copenhagen

15.05 Coffee break

15.30 **Exposure register MEGA**
Karlheinz Meffert and Margret Stückrath, Berufsgenossenschaftliches Institut für Arbeitssicherheit, Sankt Augustin

16.10 **Questionnaire based surveys**
Michel Gollac, Department of Labour, Paris

16.50 **Linking basic systems for surveillance of occupational mortality at national and local level - The Italian Experience**
Giuseppe Costa, Local Health Authority, Turin

17.30 Coffee break

18.00 **Analysis of occupational accidents as an instrument for preventive action**
Elisabeth Lagerlöf, Head of Information, Nordic Research Group on Accidents, Swedish National Institute of Occupational Health, Solna

18.40 **Monitoring systems in USA**
Hugh Conway, Director, OSHA, U.S. Department of Labor, Washington D.C.

19.20 End of first session

19.30 Reception at the Foundation

Friday 16 November 1990

08.15 Bus from Shelbourne Hotel to Foundation

SECOND SESSION:
Prospects. Which monitoring systems for the Community?

Chairman: Karl Kuhn, Bundesanstalt für Arbeitsschutz, Dortmund

09.00 **Presentation of the Foundation's discussion paper**
Rienk Prins, Nederlands Instituut voor Arbeidsomstandigheden, Amsterdam

09.30 **Introduction to discussion**
Pascal Paoli, Research Manager, Foundation

09.40 Discussion

10.20 Coffee break

10.45 Discussion

11.45 Pause

12.00 **PANEL DISCUSSION:**
Needs for monitoring systems and suggestions for the future

Chairman: Jacques Allegro, Director, Nederlands Instituut voor Arbeidsomstandigheden

Representatives from:
ETUC
UNICE
Commission of the European Communities
European Parliament
Economic and Social Committee

13.00 **Conclusions**
Eric Verborgh, Deputy Director, Foundation

13.10 Lunch

14.00 Departure - Bus to airport via city centre

OPENING

Dr. Clive Purkiss

Director
Foundation

Ladies and Gentlemen,

May I welcome you to this conference today.

As you can see, looking around you and at the list of participants, we have at this conference a most distinguished gathering. We are extremely pleased that such an eminent group of people, in the formation of both policy and practice in the field of health and safety have been able to join us.

Some of you here have been in contact with the Foundation in rather different ways and some not at all. I will therefore just say a word about the role of the Foundation in this area and the way that we work to give you a context in which we will be able to take forward our discussions.

The Foundation is clearly an organisation working at the European level. We are an independent body established by the Council of Ministers. A key feature of the Foundation is that it is quadripartite and it has the full involvement of the social partners in all Member States. We are therefore a place in which a very active dialogue between the social partners is taking place; a dialogue which also brings together, given our structure, the administrators of the various Member States and of the Commission. It is not the role of the Foundation to prepare directives or regulations, or to determine action programmes. Initiatives of that kind are clearly the task of the Commission. Nor are we a body where negotiation takes place; there are other places where that kind of activity is undertaken. Rather the Foundation is a facilitator, providing advice and information, which, we hope, enables those who are drafting policies to reach sound conclusions and providing politicians, social partners and others with the information they need to have a well informed debate: particularly on those issues which affect the medium and longer term development of the community as it concerns living and working conditions.

Now, health and safety considerations have figured in the Foundation's programme from the day of its establishment. In terms of our role, we look at health and safety from the perspective of the work environment as a whole. We look at the relation between working conditions and health. We look at how design of the building, the machine, or the work place

environment can take into account from the outset safety and health considerations. And we believe that preventative action can pay off as much as simple remedial measures.

So, in line with this the Foundation has been concerned with developing good practices. It has been looking at innovative actions which have been taken in firms and elsewhere and it has been keeping track of new measures being introduced in the Member States as well as, indeed, in countries outside the Community. Clearly we need to have some idea of how new policy might feed through to real improvements in health and safety on the ground. The Foundation is therefore concerned with identifying what information exists in Member States that might help do this. And it is also involved in gathering and disseminating such relevant information as can be obtained to help others assess what is actually happening, to help us know where the priorities are, which sectors, which occupations, which groups of people are most of risk. And what kind of policy or action is most needed. Given our constitution, in the Foundation we are clearly also in a good position to link the end-users of such information with the providers. We see this conference as one way of reinforcing that link. So, our task over these two days will be to take an inventory of the information that exists in the Community, to identify gaps and, in the light of your experience, put forward suggestions on whether and how a more homogeneous approach to information on safety and health might be achieved. Our ultimate aim here is, of course, to come up with practical suggestions for improved systems which can provide guidelines for action to help prevent accidents and illness.

Today we shall be bringing together our understanding of what exists. In your files you have a considerable amount of information. Clearly it is difficult to digest and we won't be able to study it all in these two days. But whilst we shall see that at European level we have not yet put together a consistent and comprehensive system of documentation, it is equally clear from your documentation that at a national level your collective experience proves that there does exist a whole variety of interesting and useful registers, of databases and research results.

Tomorrow we shall be looking at that material and drawing on your experience to see how improvements might be made. We will certainly look to bring together both the political expressions of need with the views of practitioners.

I am sure that it is going to be an invaluable conference, and one to which we in the Foundation very much look forward.

I would like to introduce your Chairman. I am delighted that Dr. Dan Murphy has been able to join us. He is the Director of the Occupational Medical Service at the Health and Safety Authority here in Ireland and is in an excellent position to have a very good overview of the matters that we will be considering.

EUROPEAN FOUNDATION CATALOGUE ON SYSTEMS FOR MONITORING WORKING CONDITIONS RELATED TO HEALTH AND SAFETY IN THE EUROPEAN COMMUNITY

Henrik Litske

Research Manager

Foundation

I. INTRODUCTION

The participants at the Foundation's conference received the following documents in order to discuss the first step of creating a better integration of information and documentation systems in Europe on occupational health and safety.

- **examples of national reports with extensive descriptions**
- **a consolidated report**
- **a discussion paper**

and - **a catalogue**

In this paper the **Catalogue** of Systems for Monitoring Working Conditions related to Health and Safety in the European Community is presented. The Catalogue is a **Directory** on Monitoring Systems.

The paper discusses:

- **the background of the report**
- **the content**
- **possible user groups**
- **and a possible computerisation**

II. BACKGROUND

The reason for this project is first of all to be found in the current developments in EC policies on health and safety. In the area of health and safety, Community regulations play a more and and more important role.

The European Community directives include steadily rising standards. They will affect working conditions in many Member States, if not in all Member States. And they will involve costs for the industry. In this process the Commission will be met with an increasing demand for providing evidence and documentation for the necessity of new directives. If the Commission does not have an efficient Information and Documentation system the regulatory process may come to an end. One of the conclusions of the project is: A European Information and Documentation system does not exist. At national level, however, very fine and efficient registers, data banks, research etc., exist, but these systems are created for national purposes.

It is one of the main aims of the project on "Monitoring Systems" to study how existing national monitoring systems in the working environment can be used by;

the
- **Community bodies**
- **Authorities in other Member States**
- **Researchers**

An important first step to increase the use of national monitoring systems by these other possible user groups is to describe what actually exist at present.

That is what has been done in the Catalogue on Systems for Monitoring Working Conditions related to Health and Safety in the European Community.

III. CONTENT

The catalogue consists of **summaries** of more detailed and **extensive** descriptions, which will become available as working papers in the Foundation. A hundred and seven Monitoring Systems in the twelve Member States and in international organizations have been included in the project.
Some monitoring systems are still missing. They will be included when the information-base will be updated in the future.

The Nordic Council of Ministers and the Foundation are at present discussing if the monitoring systems in the Nordic Countries could be included in the Foundations' project.

The Catalogue will be a useful instrument in linking health and safety experts in the EC and the Nordic Countries. An "Extended catalogue on Monitoring System in the EC and the Nordic Countries" is expected by the end of 1991.

In the catalogue the monitoring systems are described according to:

1. General context and structure
2. Missions and objectives
3. Descriptions
4. Output and users

The paragraph on **"Context and Structure"** will:

- identify the system (who, where, phone, fax)
- give a brief summary explaining the type of instrument

In the paragraph **"Missions and Objectives"**:

- you will see if the instrument has been developed for problem identification, prevention or compensation.

The descriptive part includes:

- a listing of indicators
- a description of methodology, technique, etc

"Output and users" is about how

- to get access
- and who can use it (conditions, etc)

The work includes information on the following categories of instruments:

1. Data collection on a regular basis
2. Data collection on an irregular basis
3. Specific surveys with broad interest
4. Documentation systems

A few countries are characterized by having a lot of registers operating on a permanent basis. Other countries are based on documentation and information systems, e.g. Italy where several efficient regional systems are in operation.

IV COMPUTERISATION

To secure the highest degree of utilisation of the information gathered, the Foundation is considering computerisation of the information bank. Computerisation will also make it easier to update the information, e.g. through a network of national correspondents.

The Foundation has developed a **sample prototype** of an electronic database of the catalogue. The prototype was presented at the Conference in Dublin on 15-16 November. The only purpose of the prototype is to illustrate what

information a future electronic database could contain and how it could be used.

Screen 1

1. Updating
2. Enquiries
3. Print reports

The scope of the prototype is to introduce section 2 on the screen: "On-line enquiries".

Section 1 and 3: Updating and reporting have not been developed at this stage. These will be important parts of the final system.

The data base can be search on the basis of:

Screen 2

1. Search using indicators
2. Search using countries/international organizations
3. Keywords searching

In the prototype only the indicators are included.

Screen 3: Main indicators

1. Workplace
2. Hazards
3. Workload / requirements
4. Working time
5. Organization of work
6. Health and work capacity

Each of these main indicators include subindicators, e.g. "Hazards" (2)

Screen 4: Subindicators

Hazards:

1. Physical hazards (noise, temperature, etc)
2. Chemical / biological hazards
3. Other Hazards

We can now ask for a list of systems about chemical hazards.

Screen 5

Total #: 45

System n°	Name	Location
9.4	Health Survey "The Netherlands Ok?" (1981)	Amsterdam
4.2	Central Substances and product database	Bonn
4.5	Qualification and Work Survey	Bonn
4.3	Technical Control Board Rheinland database	Bonn
1.1	Statistics on occupational accidents	Brussels
2.9	Danish Product Register	Copenhagen
2.11	Womens Health and Work Survey (1978)	Copenhagen
2.1	Register on Accidents	Copenhagen
	etc.	

In the right-hand corner, we read that a total of 45 Monitoring Systems in Europe, have information on chemical hazards.

The system # on the list is the number in the catalogue. The list is in alphabetic order of city. The final step of the search is to ask for a full system description.

EXPERIENCES WITH THE PRODUCT REGISTER IN DENMARK

Ole Honoré

Director
The Product Register
Danish National Institute of Occupational Health
Copenhagen

25 September 1990

Introduction

The Danish Product Register was set up in 1980 as a centre of expertise with information on chemical substances and products. The register is a joint institute of the working-environment authorities and the environmental authorities, but organizationally is a department of the National Institute of Occupational Health (Arbejdsmiljøinstituttet) under the Labour Inspectorate (Arbejdstilsynet).

Background and purpose

The establishment of the register was preceded by several years of intensive work by groups of experts and civil-service groups. The work was prompted by new legislation in the field of the working environment, which was expanded to cover health hazards in a very broad sense, previous legislation having focused on accidents. Efforts to deal with harmful substances, materials and products in the working environment were given high priority at the same time. In the EEC the directive on new hazardous substances from 1967 was amended and the new EEC Directive no. 78/831/EEC of 18 September 1979 on the EINECS list (European Inventory of Existing Commercial Chemical Substances) led to a new Chemicals Act for the external environment. New laws came into force in 1979 on chemical substances, materials and products, in the areas covered by both the Ministry of Labour and the Ministry of the Environment.

The duties of the authorities under the new laws consisted in guidance and information, regulations, studies and monitoring and supervision. However, none of the authorities had a sufficient basis of knowledge and documentation on the occurrence and use of chemical substances in Danish society to be able to fulfil these duties properly. Regardless of whether an effort was to be made to deal with problems caused by chemicals in connection with work situations, the health of private consumers, the indoor climate, spills and discharges in nature or waste management, the questions and thus the need for data are the same. Some of the questions to be answered will be:

- what substances are involved?
- how dangerous are they?
- what concentrations and quantities?

- how can they affect the environment or health?
- what can we do to remove the hazard?

Even the first question is impossible to answer unless it is known what substances are contained in the products. Although almost all limit values and all documentation relate to pure chemical substances, these will not occur as independent chemicals which are handled in the practical working situation, but as components in products in which only the most dangerous substances are indicated by the labelling - if the labelling is correct.

The Product Register was therefore set up with the following purpose:

To acquire a knowledge of

- which substances, materials and products are used in the working situation,
- where they are used, for what purpose and in what quantities,
- their chemical composition,
- the properties of substances, materials and products and their possible health and environmental effects.

Since the register forms part of an authority, the establishment, operation and use of the department are regulated in accordance with national legislation.

Study phases in the improvement of the chemical working environment

Suspicion may arise that a particular type of chemicals causes damage to health among workers. The suspicion may arise as a result of reports on injuries or illnesses, notification of the same occupational diseases in connection with particular working processes or sectors of industry.
The problem may possibly be solved by prohibiting the use of the chemicals and removing them from the work processes. However, for technical reasons this will generally not be a realistic possibility, since the work cannot then be carried out. An alternative solution is to prevent the chemicals coming into contact with the workers. This can be done either by ensuring that the chemical part of the work process takes place in a closed system

or by enclosing the worker in protective equipment. An intermediate solution is extraction combined with protective equipment, which is familiar to us for example from welding and brazing.

These devices will be expensive for businesses and are often felt by the workers to be inconvenient and uncomfortable. Nor will they solve the problems of the external environment, since the process will end in the factory chimney, the sewers or as chemical waste.

An identified health problem often cannot be related to any specific chemicals. If an identified ailment has occurred after long-term exposure to an environment, perhaps over many years, it is difficult afterwards to demonstrate precise correlations between the harmful influencing factor and the pathological effect observed later. Perhaps no-one will consider the possibility of the ailment being due to exposure at work many years previously. It is now well known that even short-term work with asbestos can cause some quite specific lung disorders many years later. Only in recent years, however, has it become known for example that workers in the graphic trades have a high incidence of cancer of the bladder. The next question is what chemical exposure is the cause?

Working-environment problems caused by chemicals are many, varied and great. However, if the problems are to be solved as a matter of priority in accordance with the resources available, a far more knowledge-based and qualitative plan of action must be based on a knowledge of

- how many workers are exposed to the harmful effects, in what sectors of industry and in what work processes,
- the severity and nature of the disease,
- the options available for removing or preventing the hazard.

The most comprehensive documentation currently available is information on the possible toxicological effects of substances. The RTECS (Registry of Toxic Effects of Chemical Substances), for example, contains assessments of and references for 96 000 substances, only some of which, however, are relevant to the European market. Extensive documentation work is also carried out in connection with fixing limit values and drawing up

classification rules. When this documentary material is considered in relation to the question of where the most serious working-environment problems occur, with a view to establishing priorities in the action taken to deal with the problems, this documentation is inadequate.
It is necessary here to have access to statistics and registers with information on correlations between occupations, disease diagnoses, deaths and hospital treatment. Particular problem areas can create a need for special registration of pathological effects, eg cancer registers or registers for allergies, where the latency period varies widely.

When it has been observed that there is a high incidence of occupationally induced diseases in an area of work, the next step is to identify the precise causes.

When one of the criteria has been established and a list of substances which can produce the relevant medical condition has been drawn up, the questions to be answered are which of these substances actually occurs? In which products do the substances occur, and how do the workers come into contact with them, eg by inhalation, via uptake through the skin or in some other way?
To answer these questions it is necessary to conduct further documentation and literature searches. to have access to registers on the chemicals in the area of work in question and their chemical compositions, information on exposure data, eg biological measurements or measured air impurities and to have a description of the work process.
The possibility and appropriateness of an effort to deal with the problem can then start to be considered. Can a work or production process be modified so that the technology becomes cleaner, or can hazardous chemicals be replaced by less hazardous ones?

Core area of Product Register

On the basis of the need described above for access to several levels and types of documentation, the register has created its "core area".

The core area of research and study in the product register is chemical and toxicological register research, defined as the development and use of

methods for describing and identifying problems in the working environment using data in the register database PROBAS and a description of potential solutions. One or more of the following points are emphasized in selecting the subject for the studies:

- Harm/effects must be serious.
- There must be a large number of exposed persons.
- Prevention must be possible.

The area consists of three main elements: hazard identification, hazard assessment and hazard prevention.
Hazard identification takes place on the basis of survey studies and epidemiological studies.
In survey studies information is collected, recorded and processed on the chemical composition of substances and products, their technical function (product type), their application (sector of industry, business activity, work process) and quantities used.

Epidemiological methods are employed to study whether a health effect of the presence of selected chemical substances and products in the working environment can be measured.
Hazard assessment takes place on the basis of toxicological summaries (data sheets) based for example on classification and labelling, lists of hazardous substances, monographs and lists of limit values for the external and internal environment. Information on the produced and delivered quantity of substances/products per year and number of employees in the sector, the business activity and the process is used as a measure of exposure. The information is also co-ordinated with exposure registers. If no data exist on the toxicological effect, an attempt is made to assess this by model calculations based on the structure of the substance. To assess the degree of exposure in the use of chemical products, use is made of methods of calculation such as VHR (Vapour Hazard Ratio), classification codes and the SUB-FAC index, which is a statistical model for calculating the risk of exceeding the limit value in the application of specific products in a particular work process under given physical conditions.
Hazard prevention (proposed action in relation to the working environment) takes place through advice and guidance on the use of chemical

substances/products.
These are proposals for regulations, the substitution of products and work processes and the development of information systems as tools for self-monitoring.

The register does not itself conduct epidemiological studies or criteria research, or produce limit-value documentation, but takes the results of others as its basis, provided these meet international quality requirements. The statistical models used are also developed outside the register.

The aim of a project in which all the phases mentioned are included is to be able to establish models for technical preventive and/or substituting solutions, where the hazardous substances/products are replaced by less hazardous ones, or where a process can be modified so that the work can be made safer from the environmental and health points of view.

As stated above, it is essential to this work that a problem can be clearly identified, that the causal connection can be clarified, that solution models that are relevant and comparable in terms of resources can be established, and that they can be applied by the users.

Sources of information for the Product Register and data included

The data for the product register come from a number of sources.
Data on substances in the register are obtained from many different sources. The principal source is the EINECS list, which contains approx 101 000 different substances. Other sources are RTECS, substance lists relevant to the working environment from Danish and foreign authorities, the literature, study results, assessments and so on.

For the individual substances the information may vary from names only, CAS number (Chemical Abstracts Service Registry number) and EEC number to all combinations of physico-chemical properties, classification and labelling, limit values in various countries, UN no. (United Nations number), technical function and application, toxicological data and actual toxicological assessments.

In August 1990 the number of substances in the Product Register stood at 131 000.

Information on the approx 48 000 products which were in the register in August 1990 comes from manufacturers, importers and suppliers and is collected via notification and registration orders, through the day-to-day work of the authorities and in connection with survey projects. The number of products notified to the Labour Inspectorate or the Environmental Protection Board represents 51% of the total number of registered products. The largest source of data with regard to information on products is thus notifications and information from firms. Approx 8000 are included in the register, some 3000 of which are located outside Denmark. Approx 40% of notified products are notified by foreign firms direct to the Product Register without the involvement of the Danish importer. This applies in particular to the notification of raw materials and products supplied on the international market, ie for use in several countries.

Notifications to the working-environment authorities represent approx 40% of products. Notifiable products are products

- which are new and hazardous in Denmark (ie products which are to be provided with a hazard label under EEC regulations)
- which contain epoxy or isocyanate
- which contain suspected carcinogenic substances
- containing asbestos
- containing volatile substances/organic solvents

Compulsory notifications to the environmental authorities make up approx 11% of the registered notifications and include

- pesticides
- active substances in pesticides
- new substances notified under EEC regulations
- detergents used in Denmark

Approx 12% of product information is the result of survey studies as part of the project tasks of the register. Examples of such surveys are:

- substances and products at graphic workplaces
- registration of refrigerants and lubricants
- survey of the use of organic solvents at Danish workplaces
- survey of products used in the wood industry and specific study of the ingredients of wood preservatives
- chemical working environment in the car industry (workshops)
- survey of hair dyes

Finally, 37% of product information originates from the day-to-day work of the authorities, eg in connection with cases concerned with classification and labelling, inspection of the instructions for use of suppliers (product data sheets), raw materials as a component of a notified product, enquiries and guidance and as an element in cases in which a worker has suffered from a condition which may have been caused by products which he handles in his work.

The quality of information on individual products ranges from very sparse information on a product to all the relevant data.

The most important types of information registered for a product are:

1. Information on the business activity
2. Whether foreign manufacturer/supplier
3. Trade name
4. Notifier (name, position, signature)
5. Information on the material
6. Composition
7. Identity of substance
8. Impurities, additives
9. Application (technical function, industry, etc)
10. Packaging (type, size)
11. Transport (method, packaging, rules)
12. Quantity produced/imported
13. Physico-chemical properties
14. Classification and labelling
15. Special safety precautions
16. Action to be taken in an emergency (fire, spillages, poisoning)
17. Waste management
18. Other (including toxicity)

In August 1990 the register contained composition particulars for approx 26 000 of the total figure of 48 000 products. These 26 000 products contain approx 6000 substances. Figure I shows the 20 most commonly registered types of product.

It is estimated that the quantity of data in the register accounts for around half of the products encountered at Danish workplaces. Because of the applicable rules on notification, there is a predominance of hazard-labelled products in the register. Since many firms outside Denmark notify the register of products, it must be assumed that many of the products can be found at workplaces throughout Europe.

When a notification has been approved in the register, a PR no. (Product Register number) is issued as acknowledgment. This number is unique to each individual product, and can be most closely compared to the number plate on a car. The PR number is to be applied to the packaging of the product, and must be shown on the data sheet which has to accompany a hazardous product at a workplace. The product can be immediately and safely identified by using the PR number when addressing an enquiry to the Product Register.

The register attaches great importance to the composition particulars being complete and correct. The quality requirement is formulated as follows:

> The Labour Inspectorate is a preventive health authority, and the construction of the register and requirements for the quality of its information are therefore established on the basis of health and safety considerations. The quality of the composition particulars in the Product Register must therefore be such that a reasonable toxicological and ecotoxicological assessment can be made, ie an assessment of the effect of the product on the state of health of workers, with regard to both acute and chronic diseases, and on the external environment.

The underlying principles of this quality requirement are:

- Nothing can be said about the hazardous nature of products, ie in a work situation, if it is not known what substances they contain.

- The hazardous nature of products cannot be assessed if the information on composition is not specific.
- The register is precisely as usable as the quality of the data entered into it.
- The register must be a suitable tool for preventive health work.
- The register must be capable, on the basis of past knowledge, of meeting the requirements of both the present and the future and not merely the requirements of the past. Substances which at present are not recognized as hazardous may later prove to be hazardous because of new toxicological findings.
- New toxicological findings on substances must be capable of being viewed in relation to the actual occurrence and application of the substances. Planning and the allocating of priorities are not otherwise possible.

A special problem arises as a result of the requirement of accuracy in the composition particulars and market and commercial information, since the information will normally be confidential. The register encountered particular problems in obtaining this information in the first few years, particularly from firms outside Europe. Since then, both the status of the register as an authority subject to strict rules on the duty of silence and the experience the register has of administrative, technical and physical security systems have become known. This, and the fact that the register has been operating for ten years without a breach of security, has meant that security is no longer a matter of debate.

The "internal" user group of the Product Register

As mentioned, the Product Register is a joint register for the Ministry of Labour and the Ministry of the Environment. Some authorities coming under the Ministry of Health can also obtain access to information from the Product Register. See Figure 2.

In the Ministry it is chemicals and health offices in the Directorate of the Labour Inspectorate and a few departments in the National Institute of Occupational Health which have direct access.

In the Environmental Protection Board it is the chemicals offices, including the Chemicals Inspectorate, which have direct access to the register, and finally the Institute of Toxicology in the Foods Board has direct access, this institute dealing particularly with product assessment tasks in the areas covered by the Ministry of the Environment and the Ministry of Health.

Other authorities also have access to the information in the register, eg the Toxins Information Centre (Giftinformationscentralen), the chemical advisory group of the Civil Defence Board (Civilforsvarsstyrelsen) and the National Fire Service Inspectorate (Statens Brandinspektion).

The Toxins Information Centre forms part of the industrial medicine clinic at the National Hospital (Rigshospitalet). The Toxins Information Centre acts as a centre of expertise for the country's casualty departments and for the industrial medicine clinics, etc.

On the basis of the composition particulars and information on the harmful effects of a number of chemical materials, the Toxins Information Centre can instruct the casualty department or industrial medicine clinic in question on diagnosis and treatment in individual cases. It is thus a case not of supplying full composition particulars, for example, but of giving instructions on specific medical aid.

The National Fire Service Inspectorate and the Civil Defence Board have direct access to the register with a view to preventing and averting accidents involving hazardous chemical substances and materials.

"External" user group of Product Register

Enquiries addressed to the Product Register can be broadly divided into six groups:

Businesses, consisting of enquiries from safety representatives and shop stewards, foremen and self-employed businessmen.

Organizations, consisting of enquiries from environmental consultants,

trade unions, schools and journalists.

The health sector, consisting of enquiries from company health services, doctors and industrial medicine clinics and research institutions.

The Labour Inspectorate, consisting of enquiries from district Labour Inspectorates.

Other authorities, consisting of enquiries from environmental and food monitoring units, municipal and county authorities and the police.

The enquiries are made both in writing and by telephone.

Most telephone applications to the Product Register for information from the database come via Kemiservice (the Chemicals Service).

Kemiservice is a telephone service which can be used by anyone to obtain guidance on, for example, the hazardous nature of materials in the working environment. The purpose of Kemiservice is to give rapid and specific answers or suggested solutions to working-environment problems faced by the enquirer at his workplace. Enquirers with questions which cannot be directly answered using the register and which require further searching in the available literature, etc, are advised to apply to the Product Register in writing, or in the case of larger tasks are referred to consultancies.

Kemiservice receives an average of 8-10 enquiries per day. Around half the enquiries come from businesses. Enquiries from organizations account for approx 10%. Questions from the health sector make up approx 15% of enquiries. The number of questions from this sector has risen sharply since Kemiservice started in February 1986. Questions from the remainder of the Labour Inspectorate constitute approx 12% of enquiries.
The remaining enquirers are either from other authorities or are private individuals.

The questions received are very varied in nature and relate to the assessment of health hazards and precautions for given substances and materials, the assessment of substitutes for substances and materials and much else.

Questions are also received on regulations, statutory orders, notification and the classification and labelling of chemical substances and products. The product types/areas most commonly asked about are detergents, solvents and graphic products. Around half the questions received by Kemiservice can be answered and completed directly by looking up in the Product Register database, PROBAS.

To give a wider circle of users access to the non-confidential part of the data contained in the Product Register via computers, a publicly available chemical information system, Kemi-Info, has been established in conjunction with the Danish national computer centre, the Data Centre (Datacentralen). This opened in January 1988, and is chiefly marketed by the Data Centre. The information is accessed via terminal, modem and the payment of a subscription. The system is operated by a simple text-searching language, CCL, which can be used to make cross-reference searches. Kemi-Info contains several sub-databases, eg information on action to be taken in the event of accidents involving chemical substances and materials and transport information supplied by the National Fire Service Inspectorate. Data are transferred from the Product Register database (PROBAS) according to criteria on up-to-dateness, validity and non-confidentiality, and at present Kemi-Info contains information on 10 100 substances and 5200 notified products.

The total use of the data in the register by the various external user groups is as follows, in decreasing order:

1. Businesses
2. Health sector
3. Organizations
4. Labour Inspectorate
5. Other authorities

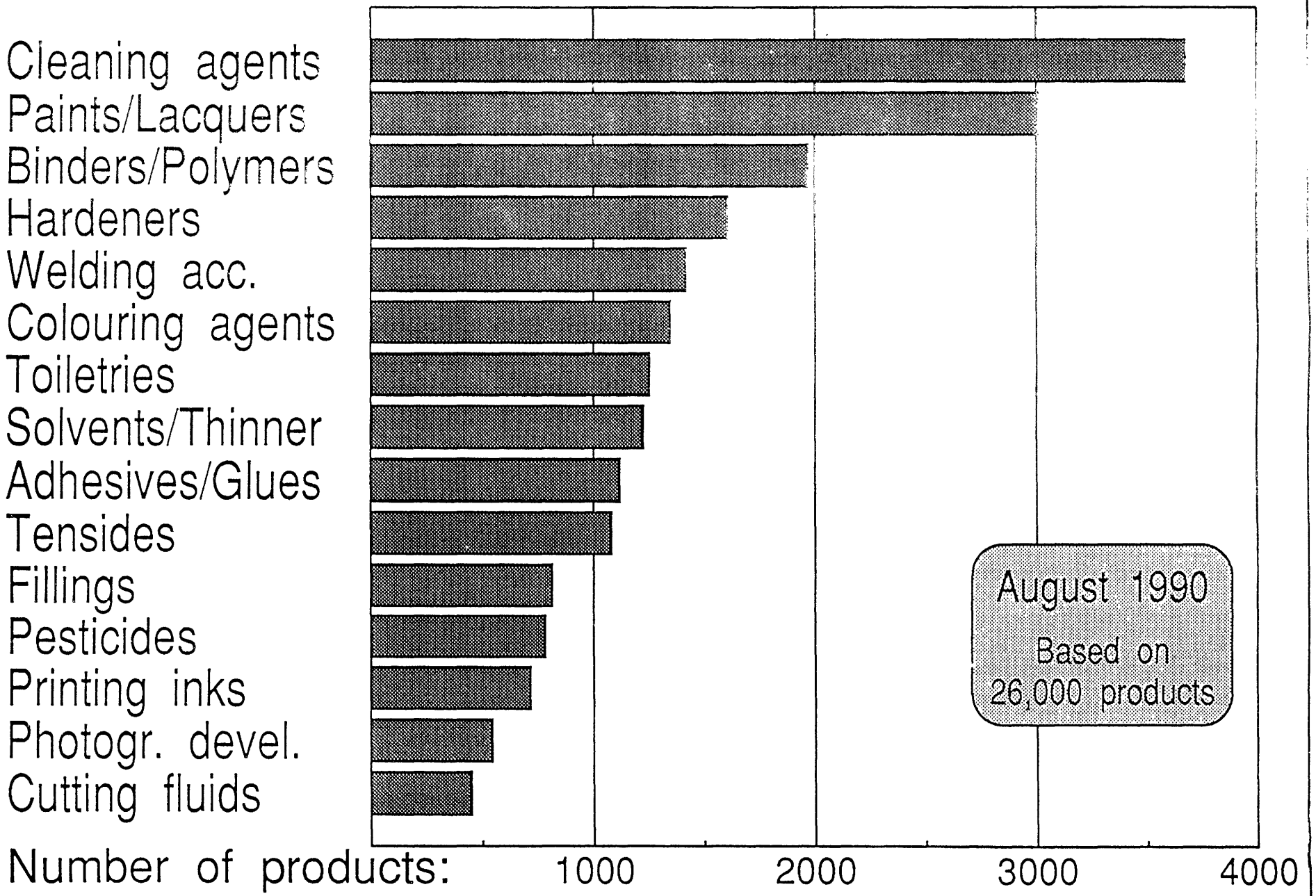
Conclusions

The Product Register was originally planned as a register to be used by a

small number of national authorities. A large proportion of the register's function still consists in dealing with tasks of this kind. In this context the knowledge contained in the register is essential for the authorities to be able to allocate priorities among tasks in this area, whether for campaigns, studies or new regulations. Data in the register are also drawn on as part of the day-to-day work of the authorities.

However, other types of work have gradually assumed increasing importance in the operation of the register. Both national and international collaborative partners, organizations and sectors of industry and other knowledge-producing institutes formulate tasks within studies, documentation and research which involve the Product Register because of the very special expertise and experience, even by international standards, which the register now possesses. This expertise offers great opportunities for solving the problems created by the use of chemicals at workplaces and elsewhere, both nationally and in the international context. Evidence of this is provided by the activities of the Product Register to date.

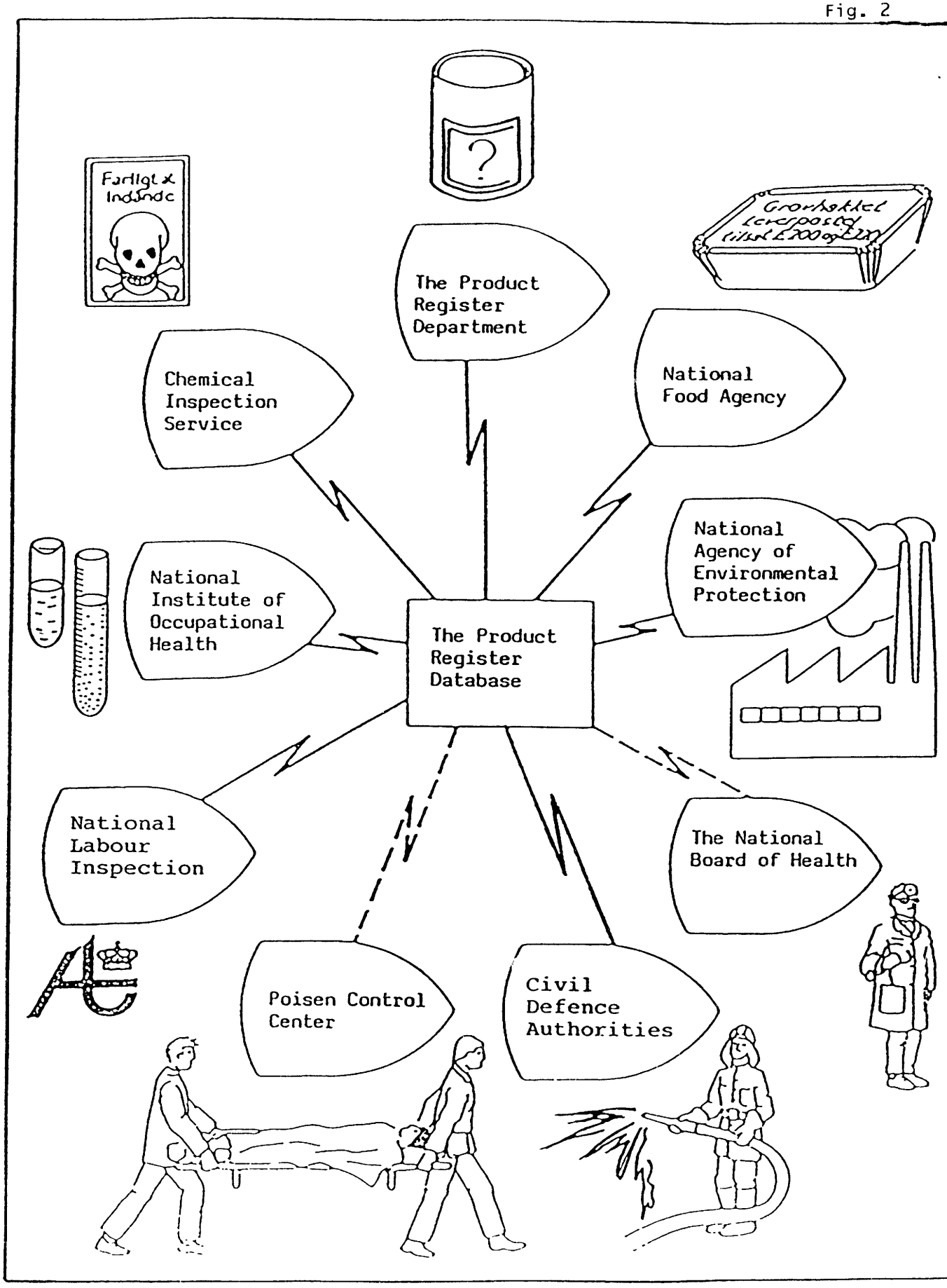
Most frequently registered product categories



MAF/PROBAS/AUG.90

Fig. 1

Fig. 2



Figur 1.

———— Users with on-line connection.

---------- Users to be connected later.

MEGA EXPOSURE DATABASE

Organisation, origin and use of the data

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MEGA Exposure Database
Organization, origin and use of the data

1. Introduction

This paper reports on the design, operation and use of the MEGA exposure database at the Occupational Associations' Institute for Safety at Work - BIA. It begins with a very brief reference to the legal basis, the organizational set-up and the origin of the data. The paper then considers the qualitative and quantitative aspects of the database. It concludes by explaining current and possible future applications.

2. Organizational set-up

In the Federal Republic of Germany employers are responsible for ensuring that limit values on dangerous substances are observed at the workplace (**Figure 1**). If the occurrence of dangerous substances at the workplace cannot be entirely ruled out, employers are required to establish whether the limit values are being exceeded, if necessary by taking measurements.[1]

As the bodies responsible for statutory accident insurance, and thus one of the pillars of industrial health and safety, the occupational associations (BGs) perform a different task: they are required, as part of the supervisory duties assigned to them by the Social Insurance Code, to inspect workplaces to ensure that employers are observing limit values, and they also have the task of advising member firms as best they can.

During their inspection and advisory activities the occupational associations take samples of the air and/or materials at member firms and submit them to the Occupational Associations' Institute for Safety at Work - BIA - for processing. This is illustrated in **Figure 2**. The breakdown of the occupational associations and their member firms into sectors should be noted in this context.

Figure 1:
Relationship between employer and occupational association

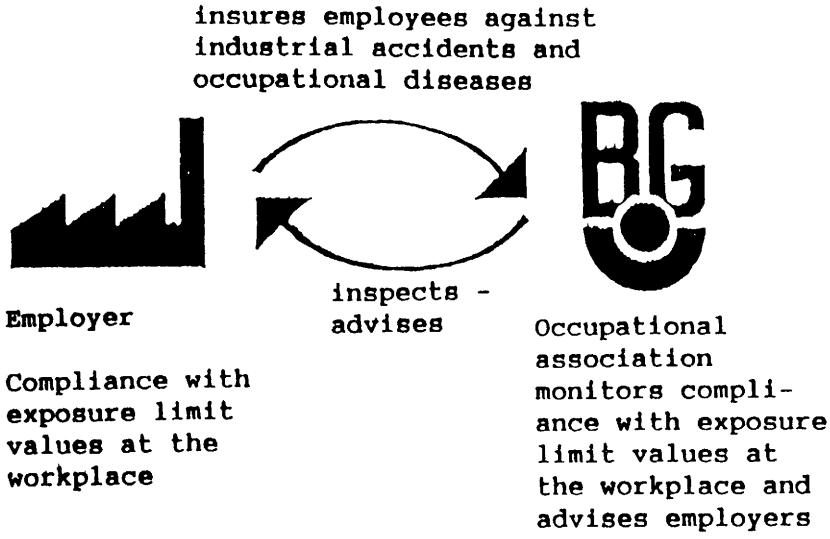

Figure 2:
Sectoral breakdown of member firms; route taken by samples of air and materials

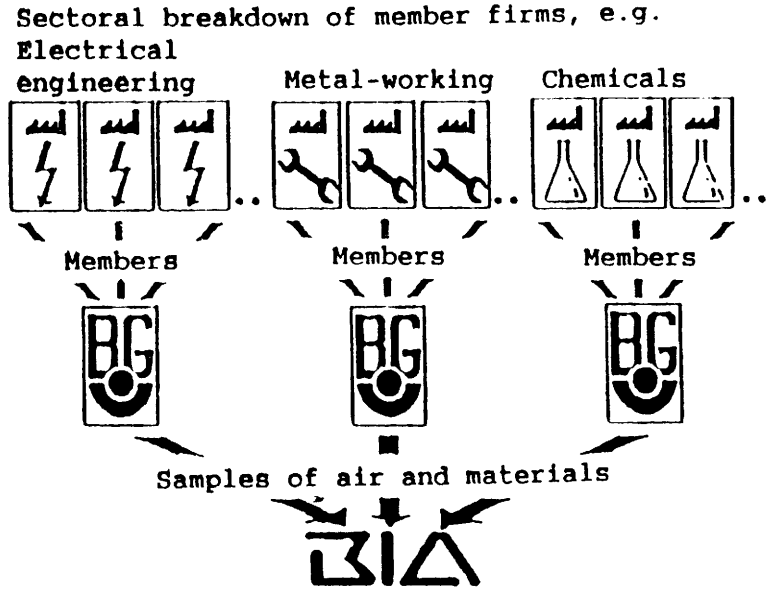

Figure 3:
Measurements of dangerous substances at the workplace: from sampling to reporting

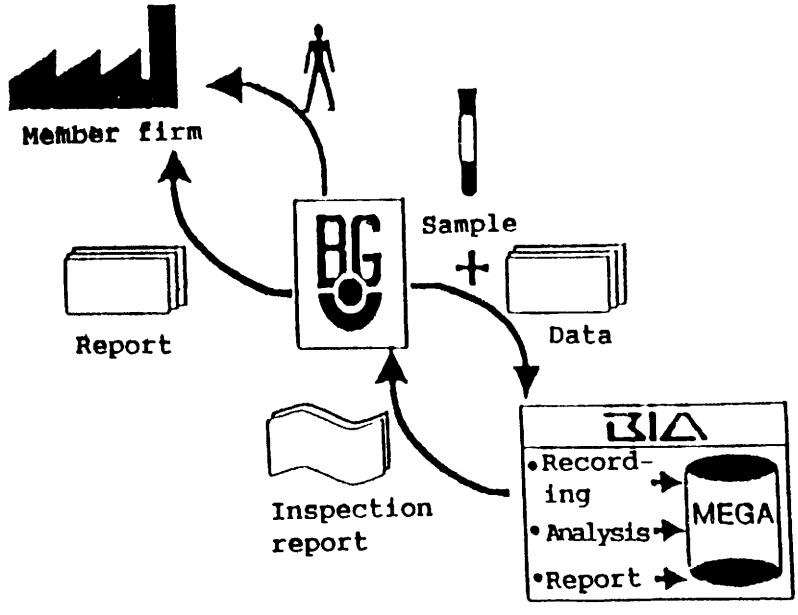

Figure 3 shows the links and sequences of operations in rather more detail. The occupational associations' inspectors take samples of the air and of materials at a wide variety of workplaces in their member firms. These samples are forwarded to the BIA together with characteristic data collected at the workplace. The BIA records all incoming sample and operational data, carries out chemical analyses and draws up an analysis report, which contains all the information needed for an assessment of industrial hygiene at the workplace. The inspection report is sent to the requesting occupational association and forms the basis of the assessment of the situation at the workplace and the action to be taken. Finally, the member firm is appropriately informed of the outcome of the inspection. Where necessary, action must be taken to improve the situation at the workplace.

Division of responsibilities between the occupational associations and the BIA

The operations described above are shared between the various decentralized agencies (occupational associations) and a central agency (BIA). The most important aspects of this division of responsibilities are:

Division of responsibilities between the occupational associations and the BIA

Occupational associations:

- contact with member firms
- selection of inspection sites/workplaces
- provision of measuring equipment
- assessment of exposure situation
- decentralized quality assurance

BIA:

- centralized organization/coordination
- centralized data input
- centralized analysis
- exchange of experience
- training/advice
- provision of work aids
- development of measuring techniques
- centralized quality assurance

Uniformly high level of quality

A more accurate description of this division of responsibilities can be found in the literature.[2,3] Reference should, however, be made to a number of very important aspects at this juncture. Appropriate action must be taken to ensure that a consistently uniform procedure is adopted and that the exposure data collected are of a uniformly high level of quality. This specifically entails:

- the uniform application of proven measuring techniques;
- the provision of uniform work aids. These work aids range from standard sets of forms for recording operational and measurement data through sampling tips and recommendations to extensive lists of codes to ensure that records are uniform and to facilitate subsequent evaluation;
- plausibility checks and double data input;
- uniform reporting on the findings of analyses, the operational and analytical data being linked to the relevant legislation. The result is a standard inspection report, already containing recommendations for the uniform assessment of the exposure situation;
- regular exchanges of experience among the agencies involved in the system and suitable training measures;
- participation in cooperative tests to monitor the quality of analyses.

The uniform sampling instructions and documentation needed for the decentralized inspection service are published in loose-leaf form[3] and updated at appropriate intervals.

The occupational associations have been following the procedures described above since about 1972. A few figures (Table 1) will show how

many people are involved in this division of responsibilities at centralized and decentralized level.

MEGA data base	
Participating agencies (occupational associations):	41
External samplers:	230
Staff at centralized level (data input, data processing, analysis, evaluation):	43

Table 1: Number of agencies and staff involved in the system

The operational, measurement and exposure data recorded are entered in a central documentation system known as MEGA.* The size of this documentation system and the utilization of the data it contains are discussed in the following.

3. MEGA database

3.1 Data stock and annual capacity

Table 2 shows MEGA's current data stock and the annual capacity of the overall system.

The annual trend in the number of analyses and the period over which the data have been collected are also of interest. These aspects are covered by **Figure 1**, which shows the trend in analyses of various groups of substances over time. It will be seen that there has been a sharp increase in the case of organic dusts, gases and vapours, while the number of

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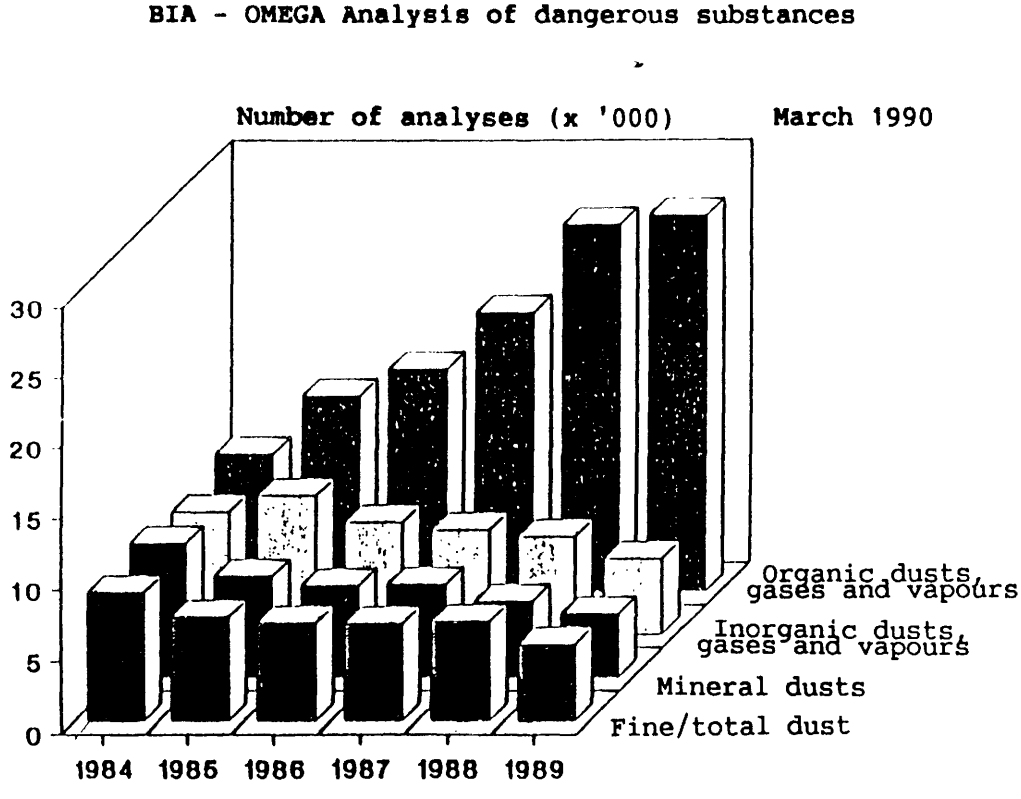
* MEGA stands, in German, for Measurement Data on Exposure to Dangerous Substances at the Workplace.

MEGA Database	
Period covered by the data:	1972-1990
Number of records:	380,000
Number of firms:	19,000
Dangerous substances analysed:	280
Annual capacity (1989)	
Samples:	22,000
Analyses:	45,000
Firms:	3,300

Table 2: Data stock and annual capacity of MEGA

analyses of organic dusts, gases and vapours, mineral dusts and fine dusts has decreased slowly but continuously since 1984.



3.2 Contents of the MEGA database

The volume and content of the data recorded in MEGA have naturally continued to develop over the years. Today up to 150 pieces of information are recorded on each sample of a dangerous substance, e.g. firm, sector, workplace, activity, production process, working materials, physical environment, exposure conditions, sampling conditions, measuring techniques and measured values.

For the subsequent evaluation of the data it is extremely important that certain data should be standardized, i.e. that a systematic code should also be included in the data record. This enables the data stock to be evaluated in anonymous form and facilitates the formation of evaluation collectives. Examples of data recorded in standardized form are those concerning sector, workplace, activity and measuring techniques.

3.3 Logical interfaces with other dangerous substance databases

The MEGA documentation system with its data on exposure conditions at workplaces forms part of a system of dangerous substance databases (**Figure 5**). This system, designed and operated by the occupational associations, is known by the acronym GESTIS.[4] The aim of the GESTIS project is to make the various databases used by the occupational associations logical and technically compatible so that users may obtain information on dangerous substances by putting any of a wide range of questions. The MEGA documentation system includes, for example, logical interfaces with the Central Substance and Product Database (ZeSP) and the Occupational Disease Documentation System (BK-Dok).

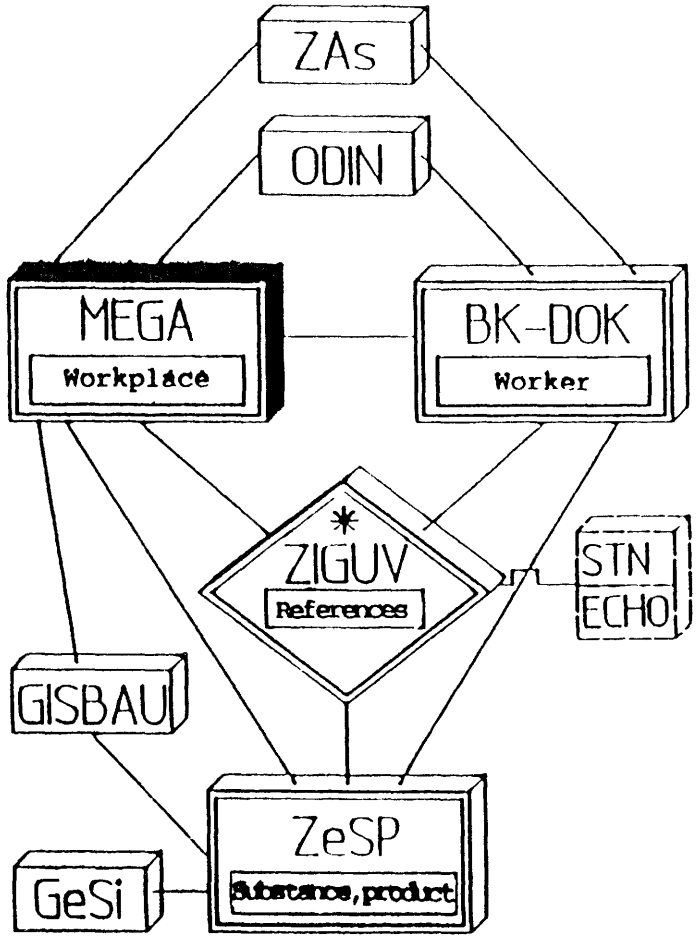


Figure 5: Integration of the MEGA database into GESTIS

GESTIS: Dangerous Substances Information System of the Occupational Associations
MEGA: Documentation on Measurement Data on Exposure to Dangerous Substances at the Workplace
ZeSP: Central Substance and Product Database
BK-DOK: Occupational Disease Documentation System
ZIGUV: Central Statutory Accident Insurance Information System
(* bibliographical database on dangerous substances)
Through ZIGUV such external databases as STN and ECHO can also be accessed.
ZAs: Central Agency for Records on Workers Exposed to Asbestos Dust (attached to the textile industry occupational association)
ODIN: Organizational Service for Follow-up Examinations (attached to the chemical industry occupational association
GISBAU Dangerous Substance Information System of the Building Industry Occupational Associations
GeSi: Dangerous Substances and Safety Project (run by the occupational association for the ceramic and glass industry)

4. Use of the MEGA database

The data contained in the MEGA documentation system may be used only by the owners of the data or with their approval. This rule applies to all requests and evaluations; free access is not possible. The owners are the occupational associations which supply the data. They are permitted unrestricted use of their own data stock. Before evaluations and searches may be carried out on data supplied by more than one occupational association, all the owners must consent to the use of their data.

The measurement data documented in the MEGA database cannot be regarded as representative in the statistical sense, since firms and inspection sites are selected by the occupational associations not by reference to statistical criteria but as the professional need arises. Firms where increased exposure is expected are therefore likely to be preselected. This would tend to result in over-representation of critical cases. On the other hand, inspections are often made after action has been taken to reduce exposure to see if it has been successful. This frequently results in wide ranges in the data on concentrations.

The data in the MEGA exposure database are used for many different purposes, as the following examples show.

Individual reports

The data are most frequently used for the routine preparation of individual reports. As outlined above, analytical reports are drawn up as part of the occupational associations' mandate to carry out inspections and give advice, but individual exposure inspections are also made where an occupational disease is suspected. In some cases, a sequence of reports is used, where this is the only way to obtain the overall picture needed for an assessment of the exposure situation.

Specific evaluations

In many cases, an evaluation is made after specific enquiries concerning, for example, substances and concentration levels where certain parameters influence exposure. Enquiries about the current state of the art in given sectors, analyses of trends over time and the effectiveness of technical and organizational protective measures are also received. Requests for such evaluations are made for a variety of reasons: they may be needed for discussions on the fixing of limit values, for comparisons of production processes and their effect on the exposure situation, for investigations relating to occupational diseases or for situational analyses in certain types of firm or areas of work.

Focal studies

The number of evaluations relating to certain focal issues is increasing, the findings being made available to professional circles in an appropriate form. In recent years evaluations have been published, for example, on asbestos,[5], carcinogenic working materials[6] and the incidence of harmful substances in foundries.[7,8]

Compilation of registers

Carrying out inspections at workplaces is very expensive. It therefore seems reasonable to suggest that they are unnecessary in certain cases. One approach would be to exempt certain types of firm and activity provided that appropriate requirements concerning, for example, work procedures, working materials and environmental conditions are satisfied. In practical terms it would be extremely useful to have registers of the exposure situation at such "standard workplaces". The information collected in many previous cases could then be assumed to apply to other, comparable workplaces, thus obviating the need, in some instances at least, for on-site inspections. Such information could also be taken into account at an early stage in the planning of production plants and processes and the design of workplaces.

One focal area in the development of the MEGA database in the next few years will certainly be the compilation of such registers of dangerous substances. In addition, the data collected over 18 years can be increasingly used in support of epidemiological studies. The continued integration of the existing dangerous substance databases in the GESTIS project will also create new opportunities, especially where complex enquiries concerning more than one area are received.

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QUESTIONNAIRE BASED SURVEYS - THE FRENCH EXPERIENCE

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FRENCH SURVEYS ON EMPLOYMENT

Estimating the extent of problems of working conditions, evaluating developments which happen spontaneously or under the influence of public policy, anticipating and measuring changes in work — these are the aims of the statistical surveys conducted by the French Ministry of Employment among representative samples of workers, the "Conditions de Travail" [Working Conditions] survey and the "Technique et Organisation du Travail" [Work Organisation and Technology] survey. The results yield orders of magnitude rather than precise measurements. However the quantity of information collected is considerable, as is the usefulness of this information for public policy decision makers, whereas the cost of these surveys is reasonable.

We shall begin by giving some examples of findingns taken from the surveys. We shall then indicate the technical characteristics of these surveys and the methodological difficulties encountered.

1. Some examples of findings

1.1. Example 1: Noise

Size of the problem

Noise is one of the main nuisance factors. In 1984, one employee out of six (16.1%, precisely) experienced in the workplace noise levels so extreme that he or she could not hear another person positioned two or three metres away, or else could only hear if this person spoke in a loud voice. The one out of six proportion is considerable: the

level of noise measured here corresponds approximately to the 85dB threshold above which noise is liable to cause deterioration of the hearing.

Identification of targets

Priority categories and sectors can be identified. Habitual exposure to an excessive level of noise mostly concerns manual workers: 38% of unskilled workers, 30% of skilled workers, as well as supervisory staff (23%) and to a lesser extent technicians (11%). In other occupations and grades, the percentages of workers exposed to noise are clearly lower than 10%. The problems of noise are much more serious in large factories: in establishments with 500 employees or more, 45% of manual workers are exposed to noises higher than 85dB, as against 20 to 25% in establishments with fewer than 10 employees. Admittedly, this nuisance is mostly found in sectors such as steelmaking (67% of manual workers exposed) or metal foundries. But it is also largely present in the electrical and electronic construction sectors (44%) or even in wholesale trading (25%). Consequently, one can identify priority targets for public policies (and estimate the number of employees concerned, their characteristics, etc.), but more general actions will also become necessary.

Elements for the evaluation of prevention policies

By comparison with 1978, the year of the previous observation, the percentage of employees exposed to noise has shown a decrease: it has fallen from 19.5 to 16.1%. This trend is partly due to economic development (decline in steelmaking, naval construction, etc.), and the development of qualifications: the proportion of manual workers in the workforce is falling, to the benefit of categories with a lower exposure level. However, to a large extent, the change can be attributed to a practical programme of action to improve the situation. The percentage of manual workers exposed to noise has fallen from 36.6 to 32.7% over six years. This favourable development can be observed in the large majority of economic activities. Admittedly, the techniques of production have evolved.

However, that evolution did not necessarily have to be favourable, so far as worker exposure to noise is concerned. In fact, public policies in this domain have been actively promoted: greater flexibility in the criteria for recognising deafness as a compensatable occupational disease: encouraging pilot actions, research, information directed to social partners. The impact of these policies has been positive. However, it has been very unequal. In fact the situation has only improved in large establishments with more than 500 employees. In small and even medium-sized establishments, the situation has somewhat deteriorated. Undoubtedly, the extent of noise problems is less there, but as these small establishments constitute a major proportion of the workforce — and one which is constantly growing — one can legitimately ask whether actions orientated more towards small establishments might not be desirable.

1.2. Example 2: Heavy loads

Evaluation of the situation

Despite technical progress, the physical effort of work shows no sign of disappearing. For example, the percentage of employees who state that they carry or move heavy loads is as high in 1984 (21.5%) as in 1978 (21.4%). In several occupational areas, including manual and clerical workers, this percentage is even showing an increase, and this is still true in the majority of economic sectors, thus demonstrating that there is no effect deriving from the structure of economic activities. It is necessary "to avoid hasty conclusions on the replacement of manual labour by robots" (Volkoff, 1990). Moreover, while economic development is cutting the number of employees in industry who have to handle heavy loads, it is liable to increase this number in the services sector. In fact, the handling of heavy loads is very common in commerce or in certain services. Moreover, in these activities, a sizeable proportion of the employees exposed are women.

Priority lines for prevention

One therefore cannot count on spontaneous technical or economic development to resolve the problem of handling heavy loads. On the other hand, statistical results suggest that the policies to be carried out in this domain should be strongly orientated towards small firms: in establishments with fewer than 50 employees, almost one manual worker in two handles heavy loads, as against less than one in four in establishments with 1,000 employees and more. On the other hand, a difficulty to be overcome will be the diversity of work situations where employees handle heavy loads: this handling is obviously very frequent in storage or delivery activities, but it is almost as frequent in packaging or maintenance.

1.3. Example 3: Information technology

Extent of the problem

Alongside the traditional problems of working conditions, new problems are making their appearance, linked to the devlopment of technology and forms of work organisation. Statistical surveys make it possible, first of all, to evaluate the extent of these new problems. Thus, the figure of four and a half million computer users in 1987 (without counting users of word processors) gives an idea of what is at stake in information technology. By comparison, numerical command machinery and industrial robots are not at all widespread: fewer than 400,000 employees involved in total.

Impact on work

Work on computers is a source of two kinds of difficulty which can be identified in the surveys. The first difficulty has to do with time spent in front of a video screen. One and a half million employees state that on average they spend at least three hours per day in front of a screen. The second problem has to do with the nature and organisation of work with computers. For certain users, information

technology appears as an enrichment of their tasks, an increase in their possibilities. For others, the tasks carried out with the aid of a computer appear very routine-bound. In our surveys, we can find this out, thanks to questions such as: "Can you change the way of entering the data?"; "Do you choose the languages or software that you use?"; or "Do you do your own programming?"

Given the way in which it is used, information technology would tend to increase inequalities of grading rather than reducing them. A high proportion of the highest graded employees use information technology. They spend a reasonable amount of time in front of the video screen, and have considerable freedom in their use of computers. Lower clerical grades spend a lot of time in front of the screen, and have far less control over the machinery. But this situation does not have to last for ever: the move from heavy-duty information technology to the use of micro-computers is translated into a very big increase in user autonomy. The technical possibilities (in the area of equipment and software) already exist to allow information technology to improve rather than disimproving the quality of work. Thus, the French government hopes to encourage this kind of development through a policy of "negotiated modernisation".

1.4. Example 4: Work organisation

It appears more and more that modernisation does not confine itself to technological change, but that one of its crucial aspects is changing modes of work organisation. The survey on work organisation and technology allows us to measure aspects of employees' work organisation. Questions are designed to determine the degree of autonomy, the level of initiative, and hierarchical relations. The repetition of this survey will make it possible to check whether, as is widely believed and as the "negotiated modernisation" policy tries to ensure, there is a growing level of autonomy and responsibility for workers.

The survey has shown that communications from the employee, both within the company and with the outside world, constituted a fundamental element of work organisation. It also demonstrated the existence of a type of work organisation which is different from the industrial model, not only in craftwork businesses, but also in personal services, commerce, activities concerned with education, information and culture, or company administration. One essential characteristic of this style of organisation is the direct or almost direct nature of the connection with the final user of the goods or services produced. This has an impact in terms of working conditions. Instead of work rhythms being controlled by the functioning of equipment or by production norms, these rhythms are directly imposed by demands coming from customers or the public. This kind of constraint on the rhythm of work is showing a rapid rate of progress (from 33% in 1978 to 39% in 1984): new sources of psychological discomfort are making their appearance, and replacing those which have disappeared.

2. Methodology of the surveys

The French system of work statistics is based on two surveys with similar methodology: the "Working Conditions" survey and the "Work Organisation and Technology" survey.

2.1. Complementary contents

The "Work Organisation and Technology" survey deals with:

- the type of work (principal and secondary);

- working time: type of timetable (fixed, alternating, variable), Sunday working, Saturday working, nightworking;

- multi-function working;

- autonomy and initiative, hierarchical responsibilities;

- communications within the company and communications with the outside world;

- work rhythms and the link between work and remuneration;

- equipment used out of a list of 15 "modern" items (robot, numerical control machinery, word processing, Minitel, micro-computer, computer terminal, video, etc.);

- the conditions of use of this equipment: duration of use, operations carried out, access to equipment, mastery of equipment, special training, implications for remuneration.

The "Working Conditions" survey deals with the following areas:

- working time: duration of the working day, commuting time, type of timetable (fixed, alternating, variable), Sunday working, Saturday working, nightworking;

- hazards from infection, from chemicals, or risks of accidents as perceived by workers;

- nuisance factors deriving from the physical environment;

- physical load;

- work organisation: time constraints, repetitiveness, timetable checks, the link between work and remuneraton.

In 1991, the working conditions survey will include questions on:

- the mental workload: need to memorise information, multiplicity of tasks, adaptation of equipment;

dealing with the public;

- the equipment used.

The connection between the two surveys will thus be enhanced.

2.2. Surveys carried out by interviews with workers

The basic methodological choice made by French statisticians in the area of working conditions was to proceed by means of enquiries carried out among the workers themselves. This choice was made after examining alternative solutions.

In particular, the idea of statistics based on observation on the job, for example on the basis of a pre-set grid, was examined but discarded. On the one hand, this type of operation would be very costly: financing it would compel researchers to abandon many other interesting research projects — quantitative or qualitative — on working conditions. On the other hand, the objectivity of the ensuing statistics would be more apparent than real. In practice, there is generally a wide margin of subjectivity in the measurements made. Moreover, ergonomics specialists have shown that the choice of measurements necessary to describe working conditions in a given job, in a truly pertinent manner, would require the observer to have previously observed the employee at work for a long time. Now, for a national statistical survey, one would have to do the opposite: draw up an analysis grid in advance, and adapt work situations to suit it. In short, the technique of analysis grids and precise measurements is better suited to the study of particular companies or economic activities, where the jobs involved are well known, than to the construction of a general statistical system.

The idea of a survey on employee satisfaction was not acceptable either. For a start, it is difficult to obtain a detailed perception of working conditions from this type of survey. A "halo effect" occurs: meaning that if a person is particularly discontented (or particularly satisfied) with one aspect of his or her job, this discontent (or satisfaction) tends to "overflow" into that employee's opinion of other

aspects of the job. Moreover, it has been noted that the replies of people questioned were dependent on their humour at the time, and were thus unreliable over a longer period. Lastly, it is known that a person's expression of opinions is strongly influenced by the personality of the questioner.

2.3. Findings to be interpreted

it was therefore decided that the "opinion survey" aspect should be limited as far as possible. Nevertheless, a certain proportion of subjectivity remains in the responses. An attempt has been made to keep this as restricted as possible. For example, in the case of noise, there can be no question of asking an employee to state the level of ambient noise in decibels, but this difficulty has been overcome by asking the employee whether or not he or she can hear a person speaking normally at two or three metres' distance. For certain topics, a more subjective approach has been unavoidable. In the case of heavy loads, not only is the weight of the load imperfectly known, but it is a very imperfect indicator of the effort involved if we do not know the nature of the handling which has been carried out. Researchers have therefore had to be content with respondents' estimate of the "heavy" nature of the loads which he or she handles.

Calculating the number of users of new technology is also not a simple matter. Two problems arise: defining a classification of equipment, and explaining what is involved to the people being questioned. Unfortunately, for most types of equipment, there is no definition which is recognised and well known by everybody. For example, the number of robots in a particular report varies from 1 to 40 depending on which definition is being used. Moreover, certain items of equipment are not easy to name or describe. For example, this is why it has not been possible to provide a correct enumeration of people working on automatically regulated continuous flow equipment in process industries.

As regards work organisation, the main difficulty is to design questions which are pertinent in the light of already established scientific knowledge of the subject, at the same time as being understandable to those answering the questions. There is no point in asking somebody to state his or her degree of autonomy or initiative at work. Generally, the respondent will not be able to answer this question, because it is formulated in abstract terms, far from everyday experience. On the other hand, most employees have little difficulty in answering a question such as the following: "You receive orders, tasks to be done, and instructions. To do your job correctly, do you apply these commands strictly, or do you act differently in certain cases, or do you behave differently in most cases?" Admittedly, a middle manager, a teacher or a researcher may find that this question seems to use an unfamiliar vocabulary. But the respondent can easily reformulate it in terms of "objectives", "programmes", etc. For a manual worker, a clerical worker, or a supervisor, it will match the respondent's way of seeing things. Generally speaking, an effort has been made to phrase questions in terms which match the situation of the greatest number, and to confine the questions to those which had a meaning for everybody, possibly with the aid of advice from the person carrying out the survey.

2.4. Repetitive surveys

The "Working Conditions" survey has already been completed in 1978 and 1984. It will run again in March 1991. The "Work Organisation and Technology" survey took place in 1987, and will be run again in 1993. Working conditions in the strict sense are basically structural data: between 1978 and 1984, there were few major developments. A time-gap of six years is therefore satisfactory.* On the other hand, there are rapid changes in production technology, and perhaps in work organisation. The six-year gap planned for the "Work Organisation and Technology" surveys is therefore too long. That is why some

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* The 1990 survey was put back one year because of the census.

questions on these topics have been introduced into the questionnaire for the "Working Conditions" survey in 1991.

2.5. One person out of every 900 at work is questioned

The field of the "Working Conditions" surveys in 1978 and 1984 covered all employees. The field of the "Work Organisation and Technology" survey in 1987 was extended to include owners of industry and commerce. The field covered by the 1991 "Working Conditions" survey, and undoubtedly the 1993 "Work Organisation and Technology" survey, will include the whole set of active members of the population who are in employment.

The sampling rate is approximately 1/900, giving samples of the order of 20,000 individuals. These samples form part of the sample for the annual employment survey (the French version of the European workforce survey): as the sample for the employment survey is renewed at the rate of one-third every year, questions are directed in the "outgoing" third: i.e. those who have been questioned for the third time, who form part of the field.

The employment survey sample is in practice a random sample of households. What this means in practice is that units of accommodation are drawn by lots (on the basis of the census and file of new accommodation) and their occupants are questioned.* More precisely, geographical areas bringing together about 200 dwellings are drawn by lots, and the sample is made up of the dwellings, hence the people, living in these areas. Although the selection procedure is very complicated, it amounts to drawing these areas at random with a uniform 1/300 rate. Stratification by region and type of commune is used (according to size, and whether an area belongs to a conurbation), yielding 210 strata. The extrapolation involves a

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* People living in communal households are not questioned, which introduces a mild bias.

weighting on the one hand by the number of dwellings per stratum, and on the other hand by the age pyramid of the French population.

2.6. A data collection system without problems

As the employment survey is partly designed to observe current data, the collection system, and therefore also the system used for the "Working Conditions" and "Work Organisation and Technology" surveys, is concentrated in a very short period of time: 4 weeks in March. For structural surveys, this is not necessary, but it is something of an advantage.

The response rate to the "Working Conditions" survey is higher than 90%. In 1984, the response rate to the employment survey was 93.6%. 2.7% of the people surveyed refused to respond, while 3.7% were absent from their dwellings throughout the duration of the survey, and it was not possible to question them. A small proportion of the people who answered the employment survey had not answered the complementary survey on working conditions, either because they refused, or because they were not available: 3.0% precisely.* In principle, the law obliges people to respond to these surveys, and those who refuse are liable to fines, but statisticians never take legal cases against people who refuse to answer their questions.

The surveyors involved belong to INSEE (Institut National de Statistique — National Statistical Institute). They are paid on a piecework basis, but mainly work for INSEE for several years at a time. INSEE's network of surveyors is generally considered as being much better than those working for private market survey institutes. The investigations on working conditions are nearly always favourably received by those questioned, and relations between the respondents

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* In the employment survey, the surveyor is authorised to question another person in the same household in order to get information on an absent person, but this does not apply to the "Working Conditions" survey.

and the surveyors are very cordial. For the "Work Organisation and Technology" survey, there was a fear that the people being surveyed might give an "official" version of their work on account of the "official" nature of the survey and of INSEE (that is to say, they might describe the work they were supposed to do, rather than the work actually done). But this does not appear to have happened.

2.7. A reasonable cost

The formula of making surveys as a supplement to the workforce survey is particularly economical. In practice, most of the approach costs (making appointments, travel) are saved.*

Moreover, the employment survey provides free of charge most of the information needed on the job involved (the activity of the firm, the profession, the grading, the seniority, the salary, etc.) as well as socio-demographic characteristics of the people being questioned (sex, age, family situation, educational qualifications, social origin, etc.).

The 1991 survey budget is as follows:

Interviews	400,000 ECUs
Training surveyors	70,000 ECUs
Quantification	100,000 ECUs
Data entry	150,000 ECUs
Analysis and programming	60,000 ECUs
Computer time	30,000 ECUs

* A small proportion remains, when the surveyor has to carry out the principal survey and the complementary survey at different times.

Thus the total comes to 810,000 ECU, paid to INSEE by the Labour Ministry. To this must be added the expenses arising from the employment of people who design the survey and will analyse its findings (approximately 200,000 ECUs), and the cost of printing the documents containing the findings (to the extent that the costs of these documents ae not covered by sales).

AN ITALIAN OCCUPATIONAL DISEASE SURVEILLANCE PROGRAMME: STRATEGY AND PRELIMINARY FINDINGS

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AN ITALIAN OCCUPATIONAL DISEASE SURVEILLANCE PROGRAM: STRATEGY AND PRELIMINARY FINDINGS

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INTRODUCTION

An occupational disease surveillance program is being developed in Italy.
It is aimed at describing incidence and prevalence of work-related morbidity, disability and mortality through a network of independent surveillance systems.

Although a number of pertinent data sets have long been available (census, workers compensation, pension fund, mortality, cancer incidence and hospital discharge files), their potentials are still largely unexploited.
Every data set is affected by one or more usual shortcomings of routinely collected data, such as questionable accuracy, reproducibility, completeness and up-dating, besides the lack of contextual information on potential confounders.
Furthermore, they are often incompatible, due to different nomenclatures adopted for coding of occupations or health outcomes.

In order to reorganize existing systems and to evaluate alternative approaches, a national task force has been appointed, made up of representatives from National and Regional Health Departments, the Central Office for Statistics (ISTAT), the National Institute for Occupational Safety and Health (ISPESL), the National Institute for Workers Compensation (INAIL), and several epidemiologic units from universities and other public research agencies.
The publication of the first Italian Occupational Mortality Report has been given right of priority.

Some preliminary findings from an occupational mortality analysis based on a linkage between census records and death certificates, are presented here.

OCCUPATIONAL MORTALITY

Study population

Two data bases have been used.
(1) The Torino longitudinal study: a 5 years follow-up (1981-85) of Torino residents identified through the 1981 census (36,867 deaths recorded among 1,056,102 persons);
(2) the National cross-sectional survey: a 6 months follow-up (November 1981-April 1982) of Italian residents aged 18-74 years, identified through the 1981 census (94,163 deaths recorded among 36,690,846 persons) (4).

Information on several sociodemographic characteristics (including industry and occupation) as of October 1981 is available from the population and housing census form.

A record-linkage procedure between the census records and the municipal Registry Office files has been used to ascertain the vital status and cause of death of cohort members (1, 2). In-depth analyses of Torino residents mortality by social group and economic activity have been published (3, 4).

Methods of analysis

The cause-specific mortality pattern of workers in different industries or occupational groups was compared either with that of the overall population or with that of other decedents, depending upon whether the standardized mortality ratio or the mortality odds ratio method was used.
A SMR was calculated by dividing the observed number of deaths in a given social, industrial or occupational subgroup by the expected number based upon age and period-specific death rates for the overall population (Torino longitudinal study).
A cause-specific MOR for an industrial or occupational title was calculated by including all other causes of death in the referent series and all other occupations (or economic activities) in the "not exposed" category (National cross-sectional survey).

Preliminary results

In order to describe potential uses of occupational mortality data (5) some preliminary results are presented.

Tables 1 and 2 provide information on sociodemographic differentials in mortality.
Among the Torino male population aged 15-59 years in 1981, unemployed and people not in the labor force (retired, disabled) show an excess overall mortality (table 1).
Among labor force participants, workers in non-manual occupations seem to survive longer than self-employed people or workers in manual occupations (table 2).

Overall SMRs by selected occupations among economically active Torino males are presented in table 3.
This is a rough index of health status for different segments of the economically active population, useful for setting priorities.
In our data, it points out the high mortality risk for occupational groups not amenable to traditional methods of cohort studies: waiters, plumbers, cleaners, drivers.

Increased risks of cancer at different sites (lung, bladder, kidney, brain, lympho-haemopoietic tissue), of chronic bronchitis and of transport accidents, explain the excess mortality among drivers (table 4).
The observed pattern corroborates previous findings on cancer risk among drivers and demonstrates the ability of such systems to relate specific occupational hazards (engine exhausts and motor vehicle accidents) to the pertinent health outcomes (lung cancer, chronic bronchitis and transport accidents).

Significantly increased risks at selected cancer sites by occupation or industry, among the Italian residents followed-up six months after the 1981 census, are shown in table 5.
The cross-tabulation of several occupation-cause of death relationships provides opportunity for: (a) controlling for suspected associations and (b) searching for previously unknown associations, to be submitted to field invistigation.

A consistent pattern of lung cancer risk by occupation emerge at a synoptic overview of both data sets (table 6), and some well established findings from ad hoc occupational studies are reproduced (welders, foundry workers, drivers). This consistency strengths the confidence in the ability of such large surveillance systems to identify known associations and to detect new ones.

DEVELOPING PROGRAMS

The national task force is working on a variety of programs to foster the implementation of an effective occupational mortality surveillance network. On the short-run (1990-91) the following five objectives should be accomplished.

1. An Italian Occupational Mortality Report will be published by the end of 1991, in which the mortality experience of workers in about 30 major industries or occupational categories will be examined and discussed.
The "exposures" of interest have been a priori selected by taking into account numerical constraints, public health priorities, background evidence, sake of comparison with surveillance systems from other countries, and expectances of the composite array of readers the report is devoted to.
Industry-specific mortality profiles will emerge from a comparative analysis of results from three record-linkage studies:
(a) a 18 years follow-up (1971-89) of Torino residents identified through the 1971 census (1,023,957 persons);
(b) a 8 years follow-up (1981-89) of Torino residents identified through the 1981 census (1,056,102 persons);
(c) a 6 months follow-up (November 1981-April 1982) of Italian residents aged 18-74 years, identified through the 1981 census (36,690,846 persons).
The synoptic scrutiny of findings from the three data sets will be limited to major economic activities and occupational titles, due to differences in industry and occupation coding between 1971 and 1981 censuses.
Data will nevertheless be screened to the maximum detail allowed by available information, and all significant associations based on at least 3 observed deaths will be reported.
Population attributable risks for selected cancer sites will also be calculated.
Presentation of results will be put into perspective by carefully weighing documented advantages and limitations of occupational mortality surveillance (6).

2. Regional cohorts, identified through 1981 and forthcoming censuses, will be enrolled in Tuscany, Latium, Emilia-Romagna and Lombardy. The geographic areas selected fullfill the following requirements: workplace surveillance of occupational risk factors is a well established practice; information systems on health outcomes (population registries, mortality files, cancer registries, hospital discharge diagnoses, health survey data) are available and suitable for linkage to census records; occupational epidemiologic teams are present and willing to become involved in the implementation and use of the surveillance system.
Data from a cancer incidence follow-up, similar to that reported from Scandinavian countries (7, 8), will pretty soon be available for the Torino longitudinal study.

3. A second national cross-sectional survey is being planned, based on a 1 year follow-up of the economically active Italian population identified through the 1991 census.

4. The feasibility of other record-linkage systems based on pension fund and workers' compensation files, is under study.
The use of public pension schemes to check the completeness of industrial cohorts has been reported from the United States (9) and Denmark (10).
Workers' compensation files have already been used to study the mortality experience of Italian workers compensated for silicosis (11, 12).

5. Comparative studies with occupational disease surveillance systems from other countries have been envisaged. In the framework of an EEC concerted action on retrospective assessment of exposure in occupational epidemiology (13), an Italian-Danish comparative analysis of cancer risk amomg farmers has been carried out, and a new concerted action including a collaborative study on cardiovascular mortality by occupation in Italy and Denmark has been agreed upon.

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Table 1. Standardized mortality ratios by employment status. Males aged 15-59 years (Torino, 1981-85).

EMPLOYMENT STATUS	SMR	(OBSERVED)
Employed	82	(3258)
Unemployed (former employed)	202	(284)
Unemployed (never employed)	150	(57)
Student	78	(83)
Retired	148	(1121)
Other status (disabled)	275	(263)
Not classifiable	221	(65)
TOTAL	**100**	**(5131)**

Table 2. Standardized mortality ratios by socioeconomic group. Economically active males aged 15-59 years (Torino, 1981-85).

SOCIOECONOMIC GROUP	SMR	(OBSERVED)
Non manual employees	86	(671)
Self employed	100	(408)
Manual employees	105	(1460)
TOTAL	**100**	**(2539)**

Table 3. Standardized mortality ratios by occupational group. Economically active males aged 15–59 years (Torino, 1981–85).

OCCUPATIONAL GROUP	SMR	(OBSERVED)
Waiter	151	(53)
Plumber	143	(28)
Service worker	130	(38)
Manager, employer	125	(56)
Driver	121	(250)
Electrician	115	(90)
Transport worker	111	(165)
Paper & printing worker	110	(43)
Sales worker	107	(285)
Food & drink worker	107	(17)
Welders & sheet metal worker	106	(58)
Mechanic	105	(241)
Metal manufacture worker	103	(556)
Wood & furniture worker	102	(39)
Teacher	94	(43)
Professional worker	91	(125)
Clerical worker	91	(405)
Medical service worker	90	(53)
Construction worker	88	(96)
Armed forces	87	(39)
Textile & clothing worker	73	(25)
Farmer	73	(14)
Technical worker	71	(94)
TOTAL	100	(2813)

Table 4. Standardized mortality ratios for selected causes of death among drivers. Economically active males aged 15-64 years (Torino, 1981-85).

CAUSE OF DEATH	SMR	(OBSERVED)
Lung cancer	135	(35)
Bladder cancer	165	(5)
Kidney cancer	190	(3)
Brain cancer	149	(5)
Lymphatic & haemopoietic tissue neoplasms	181	(9)
Coronary heart disease	106	(39)
Chronic bronchitis & emphysema	179	(9)
Transport accidents	233	(10)
ALL CAUSES	**121**	**(250)**

Table 5. Occupations and industries at significant ($p<0.05$) increased cancer risk. Economically active males aged 18–74 years (Italy, 1981–82).

CANCER SITE	OCCUPATION (O)/INDUSTRY (I)	MOR
Oral cavity & pharynx	Metal w. (O)	2.0
	Textile w. (O)	3.0
	Gas man. & distribution (I)	6.6
	Machinery, manual (I)	2.4
	Transport (I)	2.3
Oesophagus	Farmers, self-employed (O)	1.8
	Construction w., skilled (O)	2.3
	Porters (O)	5.3
	Machinery, manual (I)	2.3
	Construction (I)	2.4
Stomach	Clerical w., low level (O)	1.5
	Farmers, employed (O)	1.4
	Agriculture (I)	1.4
	Slaughtering (I)	2.6
	Railway & Tramway (I)	2.4
Colon-rectum	Teacher (O)	2.1
	Manager (O)	1.7
	Clerical w., high level (O)	1.5
	Chemical w. (O)	2.3
	Metal mining (I)	5.6
	Communication (I)	2.3
	Insurance & finance (I)	1.6
Liver	Steel w. (O)	3.1
	Plumber (O)	2.9
	Gas & petroleum extraction (I)	12.0
	Gas man. & distribution (I)	5.5
Pancreas	Metal mining (I)	8.3
	Plastic man. (I)	3.4
Nasal sinuses	Clerical w., low level (O)	9.0
	Foundry w. (O)	32.0
	Leather w. (O)	20.4
	Electricity prod. (I)	4.0
	Foundry (I)	3.8
	Motor vehicle man. (I)	11.3
	Leather (I)	70.1
	Gas man. & distribution (I)	18.0
	Restaurant & hotel (I)	3.2
Larynx	Retail trades (I)	2.1
	Railway & tramway (I)	3.5
Lung	Medical service w. (O)	1.4
	Armed forces (O)	1.4
	Fishermen (O)	2.2
	Welder (O)	1.4
	Butcher (O)	2.9
	Driver (O)	1.3
	Porter (O)	1.6

table 5, continued

CANCER SITE	OCCUPATION (O)/INDUSTRY (I)	MOR
Lung	Foundry (I)	1.6
	Carpentry (I)	1.6
Pleura	Metal (O)	3.0
	Textile (O)	6.5
	Construction, unskilled (O)	3.1
	Sailor (O)	13.2
	Iron-steel (I)	4.3
	Foundry (I)	5.3
	Textile (I)	6.1
	Road construction (I)	4.2
Bladder	Steel (O)	5.9
	Trade w. (O)	1.7
	Gas & petroleum extraction (I)	15.3
	Ship & train man. (I)	4.8
	Wholesale trades (I)	2.1
	Medical services (I)	2.5
Kidney	Clerical w., high level (O)	2.2
	Petroleum refining (I)	13.5
	Food & drink (I)	4.2
	Printing & publishing (I)	4.1
Brain	Clerical w., high level (O)	1.9
	Electronics man. (I)	2.2
	Ship & train man. (I)	3.2
Melanoma	Textile w. (O)	3.8
	Trade w. (O)	2.0
	Petroleum refining (I)	12.3
	Gas man. & distribution (I)	18.7
	Fiber man. (I)	8.7
	Textile (I)	3.5
	Railway & tramway (I)	4.6
	Insurance & finance (I)	2.5
NH's lymphoma	Clerical w., high level (O)	2.3
	Butcher (O)	6.9
	Precision instr.man. (I)	6.0
	Communication (I)	3.1
	Education & research (I)	2.5
Hodgkin's disease	Farmer, self-employed (O)	2.9
	Railway & Tramway w. (O)	4.3
	Agriculture (I)	2.0
	Electricity prod. (I)	4.0
	Gas man. & distribution (I)	17.9
	Restaurant & hotel (I)	3.2
Leukaemia	Clerical w., high level (O)	1.6
	Tailor (O)	3.1

Table 6. Occupations at significant ($p<0.05$) increased risk of lung cancer[1]. Economically active males (Italy, 1981-82 and Torino, 1981-85).

OCCUPATIONAL GROUP	RELATIVE RISK	
	ITALY	TORINO
Medical service worker	1.38	(0.85)
Armed forces	1.44	(0.57)
Fisherman	2.21	-
Butcher	2.87	-
Driver	1.28	1.35
Porter	1.56	(1.87)
Foundry worker	1.57	(1.35)
Metal worker	1.61	1.81
Welder	(1.44)	2.40
Plumber	0.76	3.10
Wood & furniture worker	(1.33)	2.18
Wholesale trade worker	(0.99)	1.85

[1]Not significant corresponding estimates from one of the two sources are in brackets.

ANALYSIS ON OCCUPATIONAL ACCIDENTS AS AN INSTRUMENT FOR PREVENTIVE ACTION

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Analysis on occupational accidents as an instrument for preventive action

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Introduction

More than 95 000 occupational injuries and 55 000 occupational diseases. were reported in 1989 to the Swedish Information System on Occupational Injuries and Diseases (ISA).
The ISA-system has been in operation since 1979. Its primary design is for prevention. The development of the occupational accidents and diseases during ten year in operation, can bee seen in figure 1.

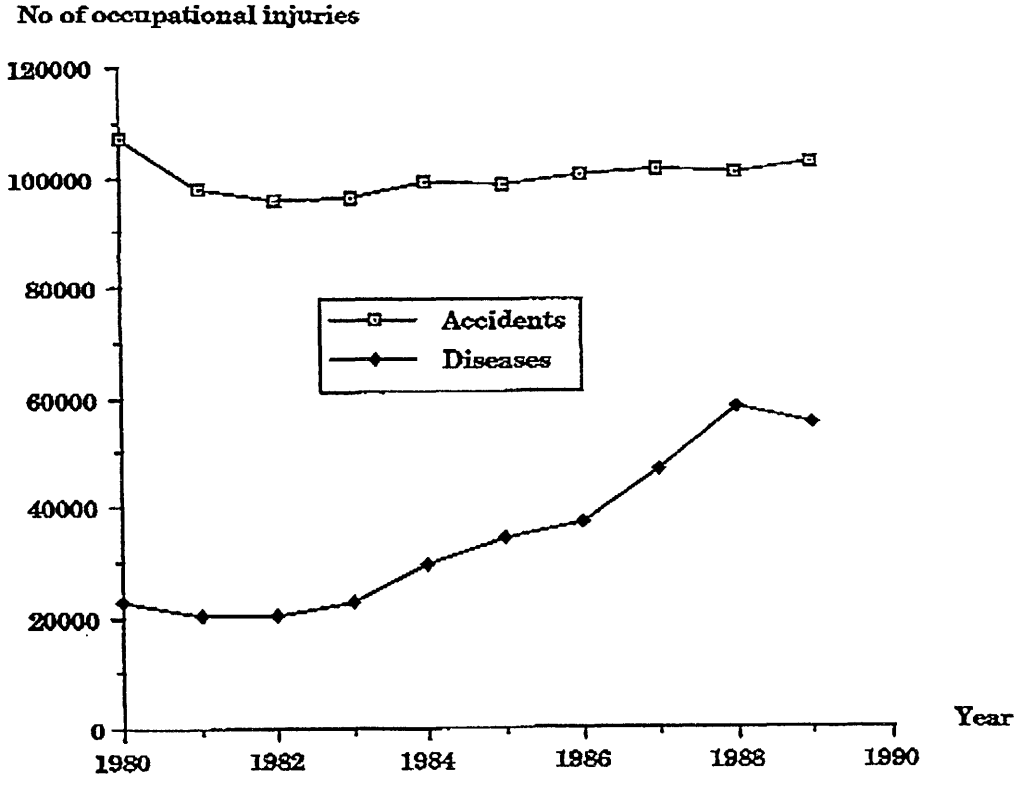

Figure 1. Occupational accidents and diseases reported to the ISA-system 1980 - 1989.

An increase in booth occupational accidents and especially diseases have occurred during the ten year. The questions is, can a system like this be used as an instrument for preventive action?
In order to be able to use an information system for preventive actions the following items must be considered

- ☐ Good quality of in-data
- ☐ Low proportion of missing cases
- ☐ Good possibilities to link between exposure and effect variables
- ☐ Planned distribution and application of results in prevention.

General context and structure

A new system for collecting and analysing information on occupational injuries and diseases was instituted in 1979, called the Swedish Information System on Occupational Injuries and Diseases (ISA). It was placed at the National Board of Occupational Safety and Health (NBOSH). Until that date the National Social Insurance Board had been responsible for the statistics on occupational injuries. The reason for the move to NBOSH was that the collected information should not only be used for statistical or economical purposes but also as a tool for improving the working environment.

The figure below shows the information that is collected in and can be obtained from the system.

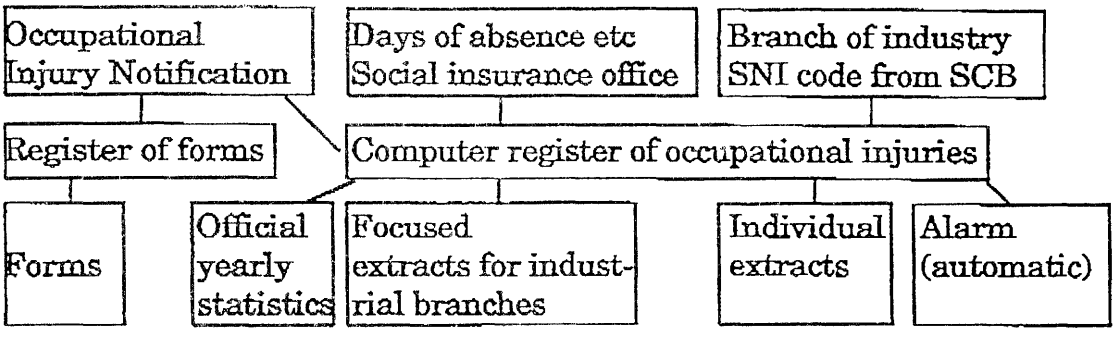

Figure 1. An overview of the information that is collected in and can be obtained from the ISA-system.

The annual cost for the system is roughly 14 million SEK. It is financed by government appropriations. Official yearly statistics are produced every year in collaboration with Statistics, Sweden.

Mission and objectives

The purpose of the ISA-system is to provide basic information required for injury prevention in industry as well as to give information about the occupational diseases and their background.
The information from the system could be *used* in the following ways

❑ Preventive measures

The measures taken could consist of either direct changes in the working environment, drafts of regulations or standards from the authorities for the design of technical products. The ISA system provides an indispensable information base, since it involves the estimation of risks in different environments, so that the right priorities will be accorded to commitments in this area.

❑ Control of measures taken

A decrease in the injury rate denotes that improvements have been taken; an increased rate denotes the contrary. Detailed statistics make it possible to follow up the effects of preventive measures. The need for detailed information is very important in order to be able to single out information concerning confounding factors such as changes in the compensation system or in the reporting system (missing cases).

❑ Research and development
Occupational injury statistics make it possible to identify problems which are deserving research priority. The statistics also contribute an important basis for the defining of problems. The system should be a source for data which can be used for research purposes. The ISA-system also permits linkage to data from different sources.

Since detailed information on every occupational accidents and diseases are collected in the system, the information can be *applied* on different levels for preventive measures, namely

❑ At the company level
Data should be provided at the local level. Enterprises, which in many cases lack data on occupational injuries and diseases need this information. But the company also need comparison data such as the incidence for the whole branch of industry it belongs to as well as data on the risks for their own geographical part of Sweden. The occupational health services units are also customers of local data. Comparative data can also be received from the system.

❑ Regional level
The Labour Districts need information about the number and incidence of occupational injuries and diseases for the companies they supervise in the region. They also need information about specific types of injuries which occur within one occupation or accidents concerned with specific types of machines or tools.

❑ National level
Data on injuries are used on the national level both among decision makers in the different government agencies, but also by the different organisations for management and labour, different branch organisations, researchers etc. The data can be used for overall planning and for allocating resources as well as for setting up programs for preventive actions.

Description

The ISA-system covers all injuries and diseases which fall under the Swedish workers compensation system. All economically active persons - employees, employers and self-employed persons- regardless of nationality are compulsory insured for occupational injuries. Persons undergoing training are also insured for occupational injuries insofar-as their training involves any such risks. Also the conscripted forces are covered by the compensation system.

For accidents to be included in the register- except dental injuries - they must result in at least one day of absence from work after the day of the accident. All occupational diseases are recorded.

The injury forms are sent by the employer to the local social insurance offices. Copies of theses are sent to the Labour Inspectorate, where specialized staff examine, codify and register the information given in the form. The data entry and the codification is computer-aided. Every Labour Inspectorate District in Sweden has a minicomputer, which is connected by data net to a big main frame computer at the NBOSH.

The occupational claims forms are divided into three groups, occupational accidents, commuting accidents and occupational diseases.

The following information on the accidents is included on the form.

1.The injured persons - age, occupation, length of services etc
2.The establishment - including economic activity and the number of employed persons
3. The working conditions - wage and salary plan, hours of work, training and experience of the injured person etc
4. The nature and extent of the injury, number of sickness days, part of body injured, type of injury
5. Circumstances of the injury -This parts makes it possible to codify the place where the injury occurred, the machines involved and course of events.

In the ISA-system it is possible to record both the events and the different agencies which are involved in the accident. A single chain of event and the corresponding external agencies to the different events can be described. To give an example; A person is carrying bricks in a wheelbarrow. Just as he was about to run the wheelbarrow onto a plank runway the latter tipped over. The injured person lost his balance, fell and injured his left knee on the floor.

Starting with the injury, the description will be the following:

A	Activity	Manual hauling
	Agency	Wheelbarrow
B	Injury event	Blow
C	Contact event	Impact with stationary object
	Agency	Floor
D	Preceding event	1. Fall to lower level
	Agency	Plank runway
		2. Tipping of working surface
		Plank runway

By using this classification it is possible to know for a particular machine, the type of activity in progress when the accident occurred. It is also possible to know the sequence of events leading up to an accident. This coding system provides a sounder basis for preventive measures.

When producing tables for official statistics, one main event and one principal agent is chosen according to a rating system based on ILOs recommendations for classification of accidents.

The economic-branch classification used is the Swedish Standard Industrial Classification of All Economic Activities (SNI) which is based on ISIC 1968. Data on economic branch of industry division at establishment level within different enterprises are obtained from the central register of enterprises, which are compiled within Statistics Sweden (SCB). The number of employees at the establishment is obtained from the same source.

The occupation of the injured person is classified according to the Nordic Occupational Classification, which is based on ISCO.

In total, more than 100 variables are recorded for every injury and more that 3,000 codes can be used in the codification of the data. This gives the system very good opportunities to describe a problem and the extent of a problem. So far the system is built up in a hierarchical coding system, no free text is possible, But every injury is linked to the original report which is being microfilmed and put up in a microfilm register. In short it takes very little time to gain access to plain text descriptions of those injuries in which one is interested.

The ISA-register permits the insertion of supplementary data if more information is needed i. e. for in-depht studies. This system has been applied to accidents involving forklift trucks, robots, forestry accidents etc. All injury forms can be identified by the injured persons social security number which permits the register to be linked to other registers in Sweden. This has been used for instance to describe injury risks for trade unions, where data from ISA was linked to the union's member register.

Outputs from ISA
The following outputs are regularly obtained through ISA.

❑ Books and printed reports

1. *Aggregated annual statistics* published every year by NBOSH and Statistics Sweden. Statistics for 1989 are now published.

2. *ISA reports.* Aggregated statistics for specific branches, machines or types of injuries. Reports have been published about agriculture, forestry, national government employees, minors, as well as trucks, industrial robots, etc.

3. *Risk data sheets.* Risk data sheets consists of a two page summary of the risks involved with a particular machine. It involves both risks for occupational injuries and diseases and preventive measures are suggested. Risk data sheets exists so far for band-saws in the food industry, eccentric presses, industrial robots, milling machines, surface planing machines, band-saws. An example of circular saws is presented in appendix B.

❑ Printouts especially ordered

1. Company retrievals.
Big companies can order pre-made enterprise printouts. The printouts can either cover the entire company or the each establishment with in the company can be presented separately. This kind of printouts are also used by the Labour Inspectorate when they visit companies. Some examples of enterprise frames are presented below.

ISA Retrieval Work injuries							
Org no	560000-0000		Name of Co: AB Järnverket				
Est no	1000-0000		LD no				
Address:	Storgatan 11		Locality: Småstad				
Municipality: Småstad							
Branch of Ind			No of employees		4193 (88-12)		
acc to Stat:	Iron and Steel				4149 (87-12)		
acc to LD					4158 (86-12)		
Accidents/1,000 empl		73(88)	County	61	Country	52	
Diseases/1,000 empl		28 (88)	County	25	Country	18	
Year	**90**	**89**	**88**	**87**	**86**	**85**	**84**
Accidents	49	264	308	232	290		
Deaths							
Diseases	20	71	116	94	104	88	14
Deaths		1	1				

The frame for occupational accidents at the enterprise, by the principal event, is presented below.

ISA retrieval	Occupational accidents at the company	
Principal event	**1989**	**1988**
Electrical accident	-	-
Fireexplosion etc	-	1
Contact chemical agent	4	5
Contact heat/cold	15	13
Falls, total	22	21
- to lower level	6	15
Misstep, thread on nail	6	6
Struck against object	6	25
Struck by flying object	10	27
Struck by falling object	19	28
Contact with moving object, total	56	55
-Moving machine parts	45	37
-Moving vehicles	5	11
-Person or animals	4	
Overload, total	38	50
-when lifting, carrying	22	29
Handling accidents	82	58
Other events	3	2
Total	264	308

In addition to this information, a detailed description of individual injuries can also be obtained. A company retrieval consisting of seven pages with different frames costs about SEK 1.000.

❑ Tailor-made special retrievals from ISA.

The central database of ISA contains more than one million occupational accidents and diseases. All data and variables are at the customers disposal (except identification data). Statistical summaries of different types can be made such as by occu-

pation, specific types of machines or vehicles, specific event etc. An example of accidents in 1988 occuring when working with three wood-working machines are given below.

Main event	Circular saw	Surface planer	Table mill	Total mach
Fall to lower level	1	-	-	1
Struck against object	10	4	7	2
Flying object, splatter	30	2	18	50
Falling objects	6	-	-	6
Contact with moving machine parts	256	116	143	515
Overload		-	1	1
Handling accidents	2	-	2	4
Others	2		1	3
Total	307	122	172	601

❑ PCISA – a PC system for work injury statistics.

PC-ISA is a PC-program for work injury statistics. It was developed for the Labour Inspectorate Districts for their planning and supervisory activities, but is now also sold to bigger companies and units for occupational health services.
The buyers get their database on a disk. It can contain data concerning work accidents and diseases over a three year period as well as reference material about the county and the country.

PC-ISA consists of a program disk and a work injury disk. It is user friendly and to a great extent self-instructional. The package includes a manual. There is an updating facility, the cost of which will depend on the number of entries on the data base. The System is IBM-compatible.

The program package consists of two parts, one search module and one presentation module. The search module gives facility to sample with reference to one or more search values. The values are a sample of those most often used in the ISA-database, such as branch of industry, occupation, age, establishment, municipality, event, external factors, nature of injury and injured part of body.
The presentation module can present retrieved samples using fixed cross-tables and reports. Reports can be given on branch of industry, individual enterprise, priority lists with severity rates for enterprise, events etc.

Who are the users of ISA?

The number of special excerpts from ISA has increased with time. The table below gives a very rough overview for the last five years. (Each number represent only one excerpt regardless of the number of specific retrievals done to fulfil the job.)

Consumer	1985	1986	1987	1988	1989
Labour Districts	105	133	208	203	271
NBOSH	60	60	66	77	58
NIOH, research	-	-	4	20	9
External	37	43	64	92	111
Total	202	236	342	392	449

An evaluation of the company related retrievals have been done at one Labour District.

22 out of 32 studied companies were pleased with the information they got through ISA and they had used it for accident prevention. Those who did not find the information useful had either too few accidents or too few employees to have a reliable statistical base.The possibility to compare the companies own risk incidence with their branch in the same county or for the whole Sweden were especially appreciated.

The Labour Inspectors found that it was a good planning instrument for their inspections, since it resulted in
- easier transition between inspections based on demands instead of time-intervals
- increased knowledge about the companies
- better definition of operational targets
- facts of the companies injury situation gave the inspector "the upper hand"
- information about the company´s injury incidence compared to other companies in the same branch of industry helped the inspection
- possibility to follow up preventive measures

Another project to increase the preventive use of ISA is done at a Labour District. If the section concerning suggestions for preventive action is not filled in, the District sends a"shuttle letter" requiring the employer to fill in the measures planned. Today the answering rate to this question is more than 60 percent compared to less than 10 percent before. Other positive effects has been:
- Many reflective, constructive suggestions have been received which through the Inspectors are brought to the knowledge of other employers.
- The "shuttle letter" also give rise to a greater awareness among the employers of the accidents risks and the possibility to prevent similar injuries.

A third way of increasing the preventive use of ISA is to use the database as a tool for preventive actions among small and middle-sized companies. Retrievals from ISA concerning small companies have been made for high risk branches of industry, high risk occupations or high risk companies.

Based on the excerpt a letter has been sent out to the companies. The most obvious risks are described as well as measures to take for preventing the risks. A certain time-interval is given the employer to change the risky circumstances. The letter is then followed by an inspection either to every company or to a sample of them.

The result showed that more than 70 percent of the employers had made changes. The branches, where this new approach has been used, are church yards, industries with wood-working machines, retail trade, conveyors in sawmills, quarries and nursery schools.

Critical analyses
Four different criteria were suggested for an evaluation of the preventive use of an information system. Let see how well the ISA- system satisfies the requirements.

❑ Good indata quality
The indata and the classifications used in ISA are very detailed and a lot of information is retrievable. However, the classification system is based on a *kinship system*, a hierarchical system. If you need to know exactly what kind of machine etc that was involved in an accident, you have to go back to the form. It is easily retrieved since it is microfilmed, but it is of course only centrally accessible.

It is easier to understand free text than hierarchical numbers, both for those who want detailed output or for those who enter data in the system. A classification based on free text is an *alphabetical library system*. The external agency code in ISA is now being revised so that free text can be used. This means more computer capacity as well as an information retrieval system, but as a result it will be easier to make interpreting and translating on the output side of the system, as a part of selection for prevention.

❑ Low proportion of missing cases.
As in all information system there are missing cases, which can lead to bias when selecting a a specific type of preventive action. Part of the bias can be predicted when you know the reporting base for the system and if the system is detailed enough to be able to follow trends.

There are no nationwide or representative non-response study made on the coverage of ISA, so it is difficult to indicate the number of missing cases. On the other hand there are a number of minor studies from various municipalities in which the average degree of coverage varies between 68% and 92%. In short these studies indicate that
- employees have a higher reporting rate then self-employed persons, mostly far mers
- accidents leading to longer absence from work or otherwise serious nature have a higher reporting rate than injuries with shorter absence from work.

No studies are done on the non-response rate of occupational diseases.

❑ Good possibilities for linking between exposure and effect variables.
The ISA system has very good opportunity to link with exposure registers. This is done regularly with the Census, with data on sickness time and disability outcome. But also other registers have been used, in order to provide specific statistics for i e trade unions, public employees etc.

A disadvantage of the ISA-system is that it contains no data on the final economic and medical consequences and the severity of the occupational injuries. They can on the other hand be found in another information system in Sweden, called the TFA-system. The TFA-system is based on a collective agreement between the central parties of the Swedish labour market. It covers the most severe cases of injuries, roughly 8,000 per year.

❑ Planned distribution and application of results for prevention.
Today, the ISA system is widely used. But it has taken time to train and educate the users of the system. The final break trough of the ISA-system occurred last year. The Swedish government set up a commission to investigate the 400 000 worst jobs in Sweden from an occupational health and safety view. This survey resulted in 17 reports. ISA was used in almost every study.

Acknowledgement
Special thanks should be given to the staff at the ISA- system and especially to Elisabet Broberg for the help in preparing this lecture. The same applies to Mr Freddy Tiefenbacher, Head of the Labour District in Skövde for his work with finding new applications of the information in the ISA-system

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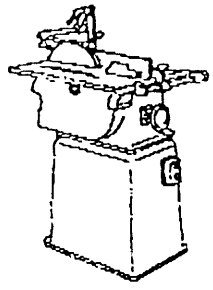
Occupational risks when working with CIRCULAR SAWS

Risk Data Sheet 1990:1 From ISA

Background: In 1988, 307 occupational accidents (376 in 1987) and 32 occupational diseases were reported when working with circular saws.

1. Injuries with circular saws in different industries



Wood industry	54%
Construction	9%
Manufacturing	8%
Vocational schools	8%
Wholesale and retail trade	6%

2. Main injury event

- ☐ Slipping when holding the work piece
- ☐ Cleaning, adjustment while the blade is moving
- ☐ Kickback of the work piece

3. Main event

- ☐ Contact with the disc sawblade
- ☐ Hit by moving work piece or sawdust

4. The most serious injuries:

7 percent of the injuries were amputation of one or more fingers. Injuries with more than 30 days absence from work, were almost all caused by contact with the disc sawblade.

Comment: The mean sickness time for injuries at circular saws was 38 days. For all machines the the sickness time was 26 days.

5. The injuries occurred at

Normal production	79%
Cleaning and adjustment	16%
Others (maintenance)	5%

6. The most common injuries:

	Circular saws	Other machines
Cuts	60%	43%
Crushing	13%	22%
Fracture	12%	10%
Amputation	7%	4%
Other injuries	5%	19%

7. Injured body parts

	Circular saws	Other machines
Fingers	81%	56%
Hand, wrist	7%	13%
Eye	2%	3%
Other body parts	8%	24%

6. Occupational diseases

Although the numbers of occupational diseases connected with the circular saws are fewer than the injuries, the causes shows a clear pattern.

Monotonuous or strenuous work	72%
Noise	22%

Comment: The occupational diseases mostly affect back and neck, shoulder. The mean sickness time is 123 days.

9. Preventive actions to be taken

Train the operators about the hazards with the machine and how to use it!
Control the safety equipment regularly!
Check that the protecting cover and the cleaver is adjusted according to the guidelines manual!
No cleaning and adjustment during production!
Pushers can be used but a feeding mechanism is preferable!
Auxillery devices should be used with thin and narrow slats!
Analyse injuries or near accidents immediately and take preventive actions!
Occupational disorders shall be prevented!

Don´t forget to report occupational injuries and diseases!

U.S. SYSTEMS FOR MONITORING WORKING CONDITIONS*

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* The views stated in this paper are those of the author and do not necessarily reflect the official position of the Occupational Safety and Health Administration

U.S. Systems for Monitoring Working Conditions

By Hugh Conway

Under the Occupational Safety and Health Act of 1970, the U.S. Department of Labor has the responsibility for setting standards to regulate workplace safety and health. Before a standard can be promulgated, the Occupational Safety and Health Administration (OSHA) must demonstrate the existence of significant risk to worker safety and health. This is required by the Act itself as interpreted by the U.S. Supreme Court in the case involving OSHA's standard for workplace exposure to benzene (Industrial Union Department, AFL-CIO v. American Petroleum Institute 448 U.S. 607 [1980]).

The Office of Regulatory Analysis in OSHA has the responsibility for developing estimates of injuries and illnesses prevented and lives saved as a result of compliance with proposed standards. The analysis must demonstrate that a proposed regulation will reduce the demonstrated risk. The benefit analysis begins with an assessment of the risk associated with the activity to be regulated. Injury, illness and fatality data from a number of different sources including the Department of Labor, other government agencies and privately developed data bases are carefully reviewed for evidence that a safety or health problem exists and that the actions which OSHA will require employers and employees to take, are justified in terms of eliminating or reducing the hazardous condition.

The nature, quality, source and limitations of important data bases relied upon by OSHA to identify safety and health problems and justify proposed remedial action, will be explored in the sections which follow. To facilitate the presentation a separate discussion will focus on accident/injury data and illness data. Fatality data will be a subpart within these two discussions. A separate section will review surveys designed to provide information on the working conditions which are believed to be causally related to occupational injury or illness. From a regulatory perspective, this information is essential to justify the control requirements in proposed regulations.

Injuries and Accident Fatalities

Injuries

It is generally agreed that between occupational safety and health statistics, the data on industrial accidents and injuries is better, more inclusive and definitive, than comparable data on occupational disease and illness. In the Bureau of Labor Statistics (BLS) annual report, Occupational Injuries and Illnesses in the United States, by Industry accidents and injury incidence rates are identified down to the four digit level of Standard Industrial Classification (SIC) detail. Table 1 presents aggregated data for major industry groups for the years 1987 and 1988.

Table 1

Industry Injury Incidence Rates per 100 Full-Time Workers

1987 and 1988

Industry	1987	1988
Private Sector	8.0	8.3
Agriculture, forestry and fishing	10.7	10.4
Mining	8.2	8.5
Construction	14.5	14.4
Manufacturing	11.3	12.1
Transportation and public utilities	8.3	8.8
Wholesale and retail trade	7.6	7.8
Finance, insurance and realestate	1.9	2.0
Services	5.3	5.3

Source: BLS, Occupational Injuries and Illnesses in the United States, By Industry, 1988, pp. 23-37.

Lost workday cases account for about one-half of these rates, with less serious injuries involving no significant lost work time or restricted activity, making up the balance. Of the total 6.2 million job related injuries reported in the private sector in 1988, 2.9 million cases resulted in lost worktime or restricted work activity.

There is a one year delay from the end of the most recent survey year and the availability of preliminary injury rate estimates for that year. For example, preliminary data for 1989 will be released in December 1990. The delay presents no particular problem for regulatory analysis and reflects time and energy needed to collect and collate the data.

The BLS data are the result of an annual statistical survey of about 280,000 establishments stratified by industry and employment size categories. Any private sector establishment covered under the OSH Act, is a potential survey candidate. The BLS sample survey collects injury and illness records which employers maintain under OSH Act recordkeeping requirements. Procedurally, the BLS survey is complicated by the fact that not all employers are required to maintain injury and illness records; some employers are always required to keep records, others are normally exempt, but periodically must keep them when notified in advance by OSHA. Inclusion in the BLS annual survey would trigger the requirement to keep records. Table 2 identifies employers who are or are not required to maintain OSHA injury illness records. The distinction between the two groups is based on employment size and relative safety and health risks perceived to be present in an industry.

TABLE 2

Employers Required To Keep OSHA Injury/Illness Records

GROUP A: Employers Always Required To Keep Records	GROUP B: Employers Normally Exempt, but Periodically Required to Keep Records 1/	
Employers with 11 employees or more at any time in the prior calendar year in the following industries: 2/ 3/ Agriculture, forestry, and fishing (SICs 01-02 & 07-09) Oil and gas extraction (SIC 13) and sulfur mining (SIC 1477) Construction (SICs 15-17) Manufacturing (SICs 20-39) Transportation and public utilities (SICs 41-42 and 44-49) Wholesale trade (SICs 50-51) Building materials and garden supplies stores (SIC 52) General merchandise stores (SIC 53) Food Stores (SIC 54) Hotels and other lodging places (SIC 70) Repair services (SICs 75 and 76) Amusement and recreation services (SIC 79) Health services (SIC 80)	Employers in all industries with less than 11 employees throughout the prior calendar year. 3/	All employers in the following industries, regardless of the number of employees: 2/ Automobile dealers and gasoline service stations (SIC 55) Apparel and accessory stores (SIC 56) Furniture, home furnishings and equipment stores (SIC 57) Eating and drinking places (SIC 58) Miscellaneous retail (SIC 59) Finance, insurance, and real estate (SICs 60-67) Personal services (SIC 72) Business services (SIC 73) Motion pictures (SIC 78) Legal services (SIC 81) Educational services (SIC 82) Social services (SIC 83) Museums, botanical, and zoological gardens (SIC 84) Membership organizations (SIC 86) Engineering, accounting, research, management, and related services (SIC 87) Miscellaneous services (SIC 89)

1/ Some States with their own occupational safety and health programs do not recognize the federal recordkeeping exemptions. Contact your nearest OSHA office or State agency to find out if State requirements differ.

2/ SICs from the Standard Industrial Classification Manual, 1987: U.S. Office of Management and Budget. Contact your nearest OSHA office or State agency for help determining your SIC.

3/ Employees are to be counted for the entire firm, not by establishment. Employees include part time workers and corporate officers.

About one million establishments currently are required to maintain OSHA injury and illness report records (out of a total 4-5 million establishments nationwide). These workplaces maintain a summary log (OSHA 200 Form) of occupational injuries and illnesses which is the record requested during the BLS annual survey. In addition to the summary log, more detailed information about the injury and illness is recorded on a second OSHA form (Form 101). Other forms that are the equivalent of the OSHA forms, usually State worker compensation claims forms, may be substituted for them.

The supplementary information coded on the OSHA 101 Form, or its equivalent, has not been systematically collected and analyzed up to now. However, this underutilization problem is being addressed. BLS and OSHA are in the process of redesigning OSHA reporting forms. The effort should result in more analytically relevant data being collected. For example, improved work process and worker activity information are being requested on the redesigned forms.

Accident Fatalities

While there is a consensus on the high quality of the BLS annual injury information, there has been general criticism of its industry fatality estimates. The Bureau itself is circumspect on the issue, acknowledging that, "Fatalities are difficult to measure in an establishment sample survey, and therefore the count of fatalities may be significantly understated". 1/ Reasons for the acknowledged undercount of fatalities include failure of employers to report very serious accidents and the BLS fatality survey, by design, only covers establishments with 11 or more employees.

For 1988, BLS estimated about 3,300 occupational fatalities based upon its sample survey of OSHA logs maintained by employers with 11 or more workers. This count was considerably below alternative estimates based upon death certificate reports kept by State agencies.

State death certificate reports are the primary source of annual occupational fatality estimates made by the National Institute for Occupational Safety and Health (NIOSH) and the private sector National Safety Council. NIOSH has developed its estimates as part of its National Traumatic Occupational Fatality (NTOF) project begun in 1980. The NTOF database consists of information from death certificates of workers who died as a result of traumatic occupational injuries. These records are drawn from the death records maintained by all State vital statistics agencies.

NIOSH acknowledges that it is not always possible to identify the occupational related cause of a fatality from death certificates. Often this "cause" is simply not reported on State forms. State vital statistics reporting units independently decide when to report a fatality as work related. Absence of standardization in reporting and inadequate training given to some State personnel reviewing and certifying death records, leads NIOSH to conclude that, "the potential for misclassification of the injury at work item will continue". 2/

In cases where workers did not die immediately from their injuries but were hospitalized, NIOSH found that work place was not identified on death certificates. These problems suggest that the NTOF data base on occupational fatalities, understates the true count. Nevertheless, the six years annual average of occupational fatalities for 1980-1985, was about 6,400 for industries covered by OSHA, almost double the BLS estimate for 1988.

The National Safety Council also estimates work related fatalities each year based on State death certificate information collected by the National Center for Health Statistics (NCHS). NCHS is an operating unit of the Centers for Disease Control, Public Health Service, U.S. Department of Health and Human Services. The National Safety Council also contacts State industrial commissions, State traffic authorities, State departments of health, insurance companies and industrial establishments for information to supplement the NCHS fatality data.

NCHS estimates fatalities each year by their cause, based upon a ten percent sample of State death records. All death certificates received each month in the vital statistics offices in the 50 States, the District of Columbia and the independent registration area of New York City, are included in the sample frame.

Based upon its sources, the National Safety Council estimates that there were 10,400 work related fatalities in 1989 (3,900 motor vehicle related). Table 3, presents the breakdown of fatalities by major industry group.

Table 3
Work Deaths by Industry Division
1989

Industry	Number of deaths
Total	10,400
Agriculture	1,300
Mining	300
Construction	2,100
Manufacturing	1,100
Transportation and public utilities	1,400
Wholesale, retail trade	1,100
Services	1,500
Government	1,600

Source: National Safety Council, Accident Facts 1990, p.37

Subtracting out "government" and "mining" to make the data more comparable with the BLS series, results in 8,500 occupational fatalities, well above the BLS 3,300 estimate. Yet there are problems with the National Safety Council estimates which require some caution when using these data. In its annual report, Accident Facts 1990, the National Safety Council presents a table which shows principal classes of accidental deaths by States for 1989.[3/] Under the "Work" classification heading, fewer than 1,900 deaths were independently substantiated by State death certificate records. Classification and attribution for about 8,500 occupational fatalities was done by the National Safety Council.

Despite their shortcomings, the injury and fatality data contained in the BLS, NIOSH and National Safety Council series, continue to be relied upon in regulatory analysis work on OSHA standards. Often one series will have better data than the others for a particular industry or occupational group. Where estimates diverge, a practical solution is to average the estimates and trust that the result is more representative than any one separate statistic.

Finally, a valuable source of information on industrial accidents is OSHA's Fatality/Catastrophe file. Record keeping requirements under the OSH Act stipulate that all occupational fatalities and all catastrophes, involving hospitalization of five or more workers, must be reported to OSHA field offices regardless of any recordkeeping exemption status which a firm might have. Separate reports on each fatality or catastrophe are completed by OSHA field compliance staff. Abstracts from these reports are entered into OSHA's automated management information system and are available for research and analysis purposes.

Each year about 1,500 "FAT-CAT" reports are filed. Information on accidents contained in these abstracts, is valuable in determining the cause and identifying corrective safety measures to be taken in order to prevent their reoccurance. Presently, this is maintained as an internal OSHA file, with public access on a request basis.

Illnesses and Disease Fatalities

Illnesses

During the same year (1988) that the BLS annual survey identified 6.2 million job related injuries, the sample survey could identify only 240,900 occupational illness cases in the private sector. About one-half of these illness cases were disorders associated with repeated trauma (due to repetitive motion, pressure or vibration). Again, the source for the information is the OSHA log from which the injury data were developed. Definitionally, an occupational illness is any abnormal condition or disorder, other than injury, caused by exposure to workplace hazards. Illnesses may be caused by chemical inhalation, absorption, ingestion or direct skin contact as well as repetitive motion and noise.

The low number of illness cases compared to injuries suggests chronic underreporting of these occurrences. Explanations for this were recently presented by an OECD commentator:

> First, many occupational diseases are clinically indistinguishable from general chronic diseases resulting from other factors. Workers spend about three-quarters of their productive lives outside the working environment; illness may therefore be the result of harmful exposure both on and off the job, and it is often not possible to assign weights to these factors' respective influences. On the other hand, a worker may be exposed to two or more hazardous agents on the job, in which case the cause-effect relationship can be confused. Furthermore, the sometimes long latency periods of individual diseases impede their timely recognition.
>
> In addition, the lack of medical expertise, i.e. insufficent training in occupational medicine, is often an obstacle to the correct classification of a disease as occupational. If there is no effective health supervision of workers, including systematic periodical examinations by competent company or other doctors, many occupational diseases will escape detection. Finally, the hundreds of chemical substances newly available each year, often without having previously been tested for health effects, make diagnosis difficult. When testing of substances does occur, results are primarily based on animal tests, and are therefore not easily extrapolated to the human organism. 4/

OSHA and BLS are attempting to address the underreporting of illnesses, through the redesign of the OSHA report forms. Essentially the revised form will attempt to elicit information on any worker who becomes ill while on the employer's premises, without requiring that a causal relationship be identified. Guidance to employers for identifying illness which appear to be work related are being developed by OSHA and BLS.

This revised form is in the process of being field tested. A revised form is scheduled to take the place of the existing OSHA 200 and 101 Forms during 1992.

The extent of illness in the general population is currently documented through the annual National Health Interview Survey (NHIS) conducted by the National Center for Health Statistics. The NHIS consists of a nationwide sample survey of about 49,000 households. Data are collected on the incidence of acute illness and injuries, the prevalence of chronic conditions and impairments and the extent of disability. The NHIS survey was initiated in 1957. Follow-on studies of NHIS respondents are conducted on an ad-hoc basis.

A follow-on study to document the statistical relationships between occupational exposures to hazardous substances and patterns of disease and illness is needed.

To return to the observation of the OECD commentator quoted above, there is an important link missing in current data collection efforts to relate illness with workplace hazards. That is, there is no systematic medical surveillance of exposed worker populations in U.S. industry today. Few companies have committed resources to develop medical tests and protocols specifically designed to detect adverse reactions to chemical exposures, dangerous fibers and dusts, or repetitive work activity. When challenged on this omission, company's can argue that no acceptable medical surveillance tests have been developed or have demonstrated success in diagnosing the early stage of disease progression. The claim reflects the lack of professional attention given to medical surveillance and biological testing by occupational health practitioners.

As part of a current study of medical surveillance practices in U.S. industry (involving a sample survey of 6,200 establishments), OSHA has developed a recommended set of test protocols for each of the approximately 600 substances currently regulated under its 1989 Air Contaminants Standard. Recommended medical tests including biological monitoring where such tests have demonstrated effectiveness, have been developed for each of the 600 substances. The approach taken was to start with the known diseases associated with exposures to hazardous substances and identify standard organ specific tests which have the potential for detecting abnormalities.

The systematic application of occupational medical surveillance procedures and test protocols linked to known hazardous substance exposures, should improve disease detection. Absent testing and the accumulation of medical evidence, these linkages will remain unidentified and unquantified.

Disease Fatalities

In a recent report (September 1990) by the National Safe Workplace Institute, a Chicago based private interest, research organization, attention and criticism were focused on the inadequacy of existing information on occupational disease. [5/] In particular the report correctly noted the absence of official government data on the number of deaths each year related to occupational diseases.

Absent government endorsed estimates, the National Safe Workplace Institute presented its own estimates on occupational disease deaths for 1987. Those estimates are presented in Table 4.

Table 4

Estimates of U.S. Occupational Disease Deaths for 1987

Cause of Death (ICD Code)	Total Deaths	Proportion Related To Work Exposures	Low Range	High Range
Cancer (140-239)	483,497	5-10%	24,175	48,350
Neurologic Disease (330-337) (340-359)	34,100	3-5%	1,023	1,705
Cardiovascular Disease (390-448)	963,611	1-3%	9,636	28,908
Pneumoconioses (500-508)	8,670	100%	8,670	8,670
Other Pulmonary Disease (460-99, 509-19)	164,164	2-4%	3,283	6,567
Renal Disease (580-89)	22,052	1-3%	220	662
Congenital Anomalies (740-59)	12,333	3-5%	370	617
Total Deaths	1,688,427		47,377	95,479
Midpoint			71,428	

ICD Code: International Classification of Diseases

Source: Compiled by the National Safe Workplace Institute (NSWI) based on data provided by the National Center for Health Statistics.

The Total Deaths column presents data provided by the National Center for Health Statistics. The Proportion Related to Work Exposure column, was developed by the Institute based upon estimates offered in various academic and scientific journals. These estimates are not always supported by empirical research results. Yet they have value because they emphasize the potential size and importance of these vital statistics and they bring attention to the inadequacy of official, documented evidence on the nature and extent of the problem.

In fact, in the benefit analysis in OSHA's Air Contaminants Standard completed early in 1989, the Agency relied upon similar unofficial estimates of occupational disease fatalities. Clearly, the government itself has a need for improved data and fatality estimates related to occupational disease. Unfortunately, such a data base will take time to develop and will be dependent upon the institution of more sophisticated medical surveillance programs and improved medical recordkeeping. Both of these initiatives, as noted above, are in the early phase of implementation.

Working Conditions

There are several reporting series currently maintained in OSHA's Integrated Management Information System (IMIS) which contain valuable information on conditions in the workplace. Some of the more important files are briefly described below. This section concludes with examples of monitoring systems developed and maintained by other government agencies (EPA/Coast Guard) and the private sector (Chemical Manufacturers Association).

OSHA Chemical Information/Sampling File

This file contains the results for 380,000 samples on about 700 hazardous substances taken during OSHA compliance inspections during the past ten years. The file contains both personal and area samples with industry and worker occupation information provided for each sample. Chemicals sampled in each SIC can be listed along with the percent of samples for each chemical found to exceed OSHA's permissible exposure limit. This file is added to continuously following OSHA compliance inspections.

OSHA Fatality/Catastrophe Reports (FAT/CAT)

About 1,500 FAT/CAT reports are investigated by OSHA each year, involving a work fatality or a "catastrophe", defined as an industrial accident which resulted in the hospitilization of 5 workers or more. By law, all workplace fatalities and catastrophies are required to be reported to OSHA. Given the annual number of actual reports, it is clear that not all occurrences are being reported to the Agency. For those that are, a brief narrative description of the tragedy is submitted by OSHA field staff. These narratives provide valuable information on the circumstances of each event and form the basis for developing new standards which are intended to avert like accidents in the future. Access to these data is available upon request.

NIOSH - Health Hazard Evaluation Reports (HHE's)

Health hazard evaluations conducted routinely by NIOSH, involve a detailed analysis of potential health hazards at each workplace studied. Federal regulations specify that the HHE program be used to inspect, sample, observe, review pertinent records, and take other measurements to determine whether "any substance or physical agent found in the place of employment has potentially toxic or hazardous effects in the concentrations or levels used or found".

Approximately 3,000 reports have been produced and up to 150 new reports are completed annually. Each report contains a detailed description of the control measures (engineering, personal protection equipment, work practices) found to exist within an establishment. The HHE reports have been criticized by university researchers for focusing on the presence of hazards at the time of the evaluation rather than on evidence of health effects related to past workplace exposures.

OSHA Regulatory Analysis - "Niche Surveys"

a. Personal Protection Equipment Usage - This data base contains over 5,300 records and estimates the extent of personal protective equipment use in U.S. industry. A random sample of about 5,300 firms was conducted in 1988-89 and the data base presents responses to the 143 question's asked during computer assisted telephone interviews. Based upon responses, estimates were made by industry of the percentage of employees wearing specific personal protective equipment (eye, foot, head protection, etc.). This data base is currently in a SAS file.

b. Health Care Worker Survey - Conducted in 1989-90, this survey included health care organizations (hospitals, doctors and dentists offices, nursing homes) and other workplaces where occupational exposure to blood borne diseases was a routine occurrence (correctional institutions, blood banks, funeral services, etc.). The random sample survey of these workplaces produced about 3,400 complete records. Information on the nature of blood exposure, work practices, personal protective equipment, and vaccination programs was collected in order to better estimate the economic impact that OSHA's proposed infectious disease - work practices standard, would have on affected businesses.

c. Medical Surveillance - A nationwide computer assisted telephone survey of over 6,200 firms was begun in 1990, to estimate the extent of workplace monitoring for illness and disease. The extent of annual or periodic medical surveillance, by industry sectors, will be estimated and the effectiveness of such programs

in (a) detecting disease or (b) documenting the absence of illness or disease will be evaluated. Results from this survey will be used in the development of any OSHA regulations on occupational medical examinations.

EPA/Coast Guard Data base - National Response Center (NRC)

The NRC data base is the result of a cooperative effort between the U.S. Environmental Protection Agency and the U.S. Coast Guard. When a hazardous substance is released and the amount released is over the EPA limit for that chemical, it is required that someone from the facility experiencing the incident call the NRC and make a report. Information taken from the report is then recorded in the NRC data base. Approximately 90 reports a day or 27,000 reports a year are entered into the data base which was started in 1982.

A record has the following information:

1. Name of the facility (withheld from all requests)
2. Location of facility
3. Type of facility
4. Date of event
5. Chemicals involved and the amounts
6. Number of fatalities
7. Number of hospitalized injuries
8. Number of nonhospitalized injuries
9. Cause of accident/incident
10. Damage as a result of the incident

These data are available from the NRC upon request in a DBase III file. Chemical and petrochemical facility records may be isolated from other records if requested.

Chemical Transportation Emergency Center (CHEMTREC)

CHEMTREC is another data base that deals with chemical accidents/incidents. It is privately maintained by the Chemical Manufacturers Association (CMA) and contains some 44,000 accident reports. Started in the early 1970's, the data base was originally constructed to deal with major train derailments where a chemical was involved. It has evolved to cover trucking, railroads and some fixed facilities (less than 10% of the data base). CHEMTREC is primarily concerned with accidents involving spills, fires, and leaks.

A record contains the following information:

1. Location and date of the event
2. Description of accident
3. Number killed
4. Number evacuated
5. Identity of chemical released
6. Media to which chemical was released
7. Facility type

(Note "cause" is not an item that is reported by this data base.)

Each record is the result of calls to the National Chemical Response and Information Offices's (NCRIO) toll free number. The data base is accessible to the general public and is used by agencies who want to know how to deal with a particular chemical when an accident/incident has taken place.

Conclusion

While the existing government monitoring system for occupational injuries is good, much needs to be done to improve the data on occupationally related illness and fatal disease. Examples of some of the more useful data files on safety and health have been provided but these are the tip of an information data base iceberg. Depending upon the specific inquiry and data needed, other government or private sector data bases may contain better, more relevant data. Despite the extent of existing data, the need for additional information on a new subject or more refined data on an old topic, is recurring. OSHA's solution to satisfy these data needs has been "niche surveys", usually conducted by telephone. The niche survey has proven an expeditious way to satisfy special safety and health data needs.

Notes

1. Bureau of Labor Statistics, Occupational Injuries and Illnesses in the United States by Industry, 1988, Washington, D.C., August 1990, p.6

2. National Institute for Occupational Safety and Health, National Traumatic Occupational Fatalities: 1980-1985, Cincinnati, Ohio, September 1989, p. 3

3. National Safety Council, Accident Facts 1990, Chicago, Illinois, 1990, p. 16

4. Organization for Economic Co-operation and Development, OECD Employment Outlook, Paris, July 1990, p. 105

5. National Safe Workplace Institute, "Beyond Neglect: The Problem of Occupational Disease in the U.S.-Labor Day '90 Report", Chicago, Illinois, September 1990.

SUMMARY OF THE CONSOLIDATED REPORT

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October 1990

SUMMARY OF THE CONSOLIDATED REPORT ON SYSTEMS FOR MONITORING WORKING CONDITIONS RELATING TO HEALTH AND SAFETY IN EUROPE

Introduction

Adequate and up to date information on working conditions is becoming more and more important in the EC Member States. Public authorities, employers (organizations), employees (labour unions), researchers and professionals show a growing awareness and need for continuous information. Not only changing technologies and their consequences or requirements regarding the safety and health of the work force stimulate the awareness and request for regular and integral information. Also high levels of work incapacity or disability rates as well as changes in the demographic or qualification structures in the labour force necessitate an insight in the developments of the contents and conditions of work.

In the light of these developments it seems fruitful to compare structure, output and utilization of those systems that, on a more or less regular basis, attempt to provide information on working conditions.

So the European Foundation for the Improvement of Living and Working Conditions in Dublin decided to carry out a study in the period mid 1989 - mid 1990 with the purpose of gathering information on "all" existing systems and instruments for monitoring working conditions related to safety and health. The systems and instruments included in this project have been studied in all Member States and in relevant international organizations (WHO, EEC).

The aims of the project were:

- to make an overall assessment of the existing instruments for identifying risk factors, and working conditions in general, in as far as they are creating risk situations;
- to contribute to the establishment of more consistent indicators at Community level;
- to complement existing Community data and fill possible gaps in Community knowledge.

The descriptions focus on three major dimensions:

- methodologies (sample applied, data collection, etc.);
- objectives (specific goals);
- uses and end-users (intended and actual users);

One of the products of the project is the consolidated report, which gives an overview of the main systems and their utilization. This report discusses the methodologies, possibilities of rationalization, gaps between needs and available information, developments and recommendations to improve monitoring systems in the Community. Furthermore a catalogue of systems has been conceived, containing in a summarized way basic information on objectives, content and use of the systems.

A general overview

It was clear from the onset that there is a great diversity among the various Member States regarding number and scope of the various systems. In some countries 'monitoring' is largely limited to the recording and reporting of occupational accidents and diseases. In other countries more extensive 'monitoring' is conducted by additional regular surveys on working conditions or documentation systems of substances, certain sectors of industry, etc.
Regarding the focus of 'monitoring' it can be said that in most countries the main attention is given to the measurement and description of working place conditions or job characteristics, while in a minority of the countries additional attention is given to the measurement of the health situation of the (working) population.

As far as instruments with a supra-national character are concerned, two instruments which meet the selection criteria have been described. Firstly, in 1980 the WHO Regional Committee for Europe adopted a regional strategy resulting in the formation of 38 specific targets relating to health. Several of the targets are of direct relevance to the work environment. The general aim is to asses the progress of the development concerning these targets in the Member States.
Secondly we included the EEC Eurostat Labour Force Survey. This instrument is applied in a uniform way in all Member States

and contains a limited number of working conditions indicators (working time, shift-work). The main users can be found among governmental agencies dealing with (international) labour market issues.

The systems covered in the inquiry can be classified into three types, which differ vis-à-vis the degree in which they provide a direct insight in safety and health aspects of working conditions:

1. Systems directly describing actual working conditions of the work force in a country, region, sector, etc. The instruments falling into this category are surveys and (micro-)census;

2. Systems based upon (social security) data on reported occupational accidents and diseases, as well as work incapacity (sickness absence) are the major elements of this category. These systems generate information on outcomes of certain working conditions.

3. Other systems, containing indirect data to be processed or linked to gather information on working conditions. This category comprises data bases, registers as well as documentation systems on substances, exposures, tools, etc.

Systems directly describing working conditions

In many countries some information based upon census-data is available. However, it was generally found that information on working conditions is very poor. Furthermore this information is produced with rather long intervals. In contrast, work force surveys or general health status inquiries show already many advantages, and a lot of valuable information on working conditions can be obtained.

In general it may be stated that surveys conducted directly among employees contain most information on health and safety aspects of working conditions. Despite the risk of subjectivity of answers to survey questions, our inquiry indicated

that this type of survey can provide most detailed information as to work places, sectors, physical and socio-psychological risk factors, or perceived consequences. Furthermore it allows accounting for confounding factors, as also person-related aspects may be measured.

The use of the information lies in the description of the state of affairs and developments in working conditions, the identification of sectors, jobs or work places with certain health risks, and the availability of some "standards" which can be used as a reference for specific studies.

Systems based on social security data

Most widespread are those systems which deal with the outcomes of unhealthy and unsafe working conditions: i.e. data sources comprising information on occupational accidents, diseases and work incapacity (sickness absence, disablement). The available information can partly be seen as the by-product of the administration of social insurance programmes. In some cases, however, these systems function, sometimes through samples, as major providers of information for preventive actions.

Statistics on occupational accidents are mainly used for descriptive purposes, for generating hypotheses or the detection of high-risk jobs, sectors or work places. Utilization for preventive action, design of safety regulations and evaluation (of safety programmes) are generally reported goals.

This most widespread type of monitoring system, however, shows many restrictions. Work place characteristics are measured indirectly, partially, and only for a non-representative sample of the work force ("victims"). In general these systems on itself therefore do not always provide adequate information on potential risk categories.

Other systems: registers and documentation systems

Our third category of systems, which in a rather indirect way provides insight in working conditions, shows a very heterogeneous composition. Both "traditional" tools as occupational mortality statistics (e.g. United Kingdom) and a modern data base of exposed persons are included (e.g. Denmark).
These systems, dealing with discerned aspects of working conditions often show serious limitations as to risks covered, sector, region, or intended users (experts). Some of these systems are rather poor regarding information on working conditions, as the (most recent) job or profession of an employee is the only characteristic covered (e.g. mortality, cancer registers, lead exposures). Data from such systems seem to be used in particular for research purposes.

Other systems have been developed, providing more information for preventive action. Product and substance registers or data bases have come into development in the 1980's in France, Denmark and Germany. They intend to inform a wide range of users: labour inspectors, employers, employees, social partners, occupational health services, etc.
These systems have explicit preventive purposes, not only on national or sectorial, but in particular on work place level. Therefore, much attention has been paid to the accessibility.

Conclusions

Systems entirely related to social security data (accidents, diseases, sickness absence) are very limited regarding the measurement of working conditions, population covered, recentness, reliability (under-reporting) and specificity of information.
Some interesting developments were noted, as in some countries (e.g Germany) sick funds, occupational associations and researchers design data bases, which integrate work incapacity data and work place information for epidemiological research and in-company preventive actions.

Surveys carried out by interviewing employees or based upon employers' reports, seem to be a major step forward. Despite

the extensive research and financial support required, systems based on these instruments show several advantages compared to the instruments based on social security data. Many more sectors and employees may be covered, and more specified information on working conditions can be obtained. Also relationships with experienced health or safety can be studied.

Data bases comprising information on exposures, tools, substances and hazards, specified for jobs and sectors, were shown to be the most recent type of monitoring systems. Many systems started being built up for restricted types of hazards and exposures, and for a limited number of sectors. The data comprising the core information of the system may originate from a variety of sources: occupational disease benefit claims, labour inspectorate reports, epidemiological studies, risk analyses, etc.

Only in very few countries system outcomes and their utilization have been evaluated systematically. Much more was known on the goals intended than regarding the goals reached. Only for some systems (e.g. in Germany and the U.K.) informants or literature indicated serious reflection on the accuracy of systems vis-à-vis the realization of the goals (originally) intended.
Furthermore it was indicated that information directly related to (the measurement of) working conditions (surveys) finds its major use more in research and epidemiological purposes, whereas the systems measuring a very limited aspect of working conditions (exposures, hazards) are more frequently used for preventive and inspection activities.
The highest accessibility was found in data bases on hazards, tools, and substances. Systems based on information collected by surveys or from social security administrations generally showed some more restrictions as to availability of information.

The ideal use and interaction of systems internationally is still far from reality. Harmonization and integration already seem to state a problem within many countries themselves. In

no country just one single system was in operation. Some limitations often found, regarding existing systems, concern the lack of integration or the absence of a specific design of a permanent information system.
Overlap of information is sometimes a serious problem. The collection of the same information by different systems gives redundancy or contradictions, and does not contribute to a deeper insight or a wider scope. Some few examples could be found (Germany, U.K.) where projects are carried out to integrate systems within one country, but so far results are only limited.

Finally, technical linkage of systems seems to be obtainable nowadays. But, given the variety of systems and their contents, we are not very optimistic about the actual realization. Some promising prospects seem however apparent in the field of linkage of technical data bases (tools, substances etc.).

Recommendations

Firstly, the availability of a Community-wide overview can be seen as an important prerequisite for cooperation and exchange of information. So the catalogue of monitoring systems, of which the first edition will shortly be published, will need a regular update.

Secondly, it was shown that most monitoring systems mainly focus on the technical and physical aspects of working life (hazards, machines, occupational hygiene, etc.). Vis-à-vis the changes in technology other potential hazards need to be included more satisfactorily (e.g. mental strains, qualification, feelings of job uncertainty, etc.).

Thirdly, it has become clear that despite the developments going on in several countries, in other Member States information on working conditions is still quite poor.
To that end it would be very informative to investigate experienced working conditions in the Community countries in a standardized way (e.g. survey). Apart from the provision of recent and detailed Community-based information, such an inquiry

may have a stimulating influence on national research and prevention programmes.

Finally, international cooperation and network integration should be extended. International cooperation may be stimulating as it gives insight in how one's neighbours are dealing with the same problems. System holders could benefit from foreign experiences regarding the use of information for preventive, research and decision making purposes.

WHICH MONITORING SYSTEMS FOR THE COMMUNITY

Pascal Paoli

Research Manager
Foundation

16 November 1990

As has been said earlier, it is at the present time difficult to assess the standard of working conditions related to health and safety in the EC and it is difficult to point precisely where the problems are and what their causes are.

This assessment and the set up of preventive actions are difficult because:

1. Monitoring systems, although sometimes very precise and developed at national level, are most of the time different from one country to the other. Therefore the information cannot be compared and is difficult to exchange. This can also happen within one country between different systems, as was illustrated in the Italian presentation yesterday (Occupational disease surveillance programme by Dr. G. Costa).

2. The information, although it exists, is not easily available or one can not get access to it (confidentiality).

3. The information simply does not exist in some cases or is insufficient or is not adapted to the needs. As was illustrated yesterday the information does not always need to be refined. But it certainly needs to be made more practical and more oriented towards prevention. Providing figures do not in itself enhance prevention. Preventors need information which can help them redesign workplaces.

The assessment is difficult while at the same time European integration, in the social area in particular, leads to a growing number of initiatives being taken at Community level. This necessitates to be able to identify more clearly:

- where priorities are,
- which actions are necessary,
- where progress is made.

In this context we would like the conference to deal today with 2 main issues:

- what kind of information is necessary at Community level?
- which instruments can (or could) provide this information? Do they exist or should they be set up?

When we put this question to policy makers from all sides two years ago, the most frequent answer was: we do not know. Show us what kind of information is available and we will tell you more precisely what we need!.

This we have done in drafting the catalogue presented to you yesterday. We see this descriptive work, which will be in the future updated and set on a computerised databank, as essential but only as a very first step.

The Foundation would like to seize the opportunity of having so many experts and policy makers in this room to explore jointly with you what could be done in the future.

May I therefore suggest a **structure for our discussion**, articulated around three objectives:

1. Facilitate access to existing information and disseminate existing information;

2. Coordinate initiatives to improve data collecting;

3. Harmonise and rationalise information systems; develop information systems at Community level.

1. Facilitate access to existing information and disseminate existing information

It is what the Foundation has started doing by drafting the present catalogue. It is certainly not complete but certainly offers a good basis and a sound starting point. In fact we intend to update it and to make it more accessible by setting up a computerised databank.

Beyond the fact that such a databank does indicate where to get information we hope that little by little good ideas, could spread around and that sound indicators and methodologies could be picked up by other countries and organisations, in particular when new systems being set up.

In the long term one would therefore expect comparability to increase. The questions put to you are:

- how could we improve the catalogue both qualitatively and quantitatively (should we extend to sector based data for example)?

- how could we foster the exchange and dissemination of information? For example should a series of specialised networks (on questionnaire based surveys, or on product or exposure registers for example) be set up in order to enable regular exchange of information between similar organisations in the member states?

2. Coordinate initiatives to improve data collection

It is possible to try to go one step further by being more pro-active. Exchanging and disseminating existing information in the hope that mutual enrichment will occur is relatively easy. But a more ambitious task would be:

- to identify gaps in information and try to fill them;
- to collect and centralise information on specific issues.

It is not so much a question of harmonising methodologies and data collecting, but rather of agreeing issues deemed important and collecting information on these issues whether the data collection systems are identical or not.

Every organisation would be free to do as it wants. Different methodologies could be implemented. For example on an issue such as **noise** information could be drawn together through questionnaires, analysis of occupational diseases, specific reports, epidemiological surveys, etc. The aim is to make a clear assessment of the problem, its causes, and the ways of solving it by preventive action.

Therefore the questions we put to you are:

- would it be useful to set up such coordination to improve data collecting and if yes how?

- are there any issues where data is badly lacking and where investigation drawing together whatever data exists (even not of a comparable nature) could be envisaged?

3. Harmonise and rationalise information systems; develop information systems at Community level

This step is more ambitious again than the previous one. It leads to structural changes. In order to make information more comparable, methodologies and indicators are made identical. At least a number of agreements could be reached so as to facilitate the exchange of information and avoid duplication.

A striking example would be **product registers**. Products and substances are generally the same being used in the various countries. Ole Honoré said yesterday that 40% of substances in the Danish register were declared by companies outside Denmark. So we need therefore 12 national product registers? Maybe yes but common standards for filing information might then be used so as to facilitate interconnection and rationalise the system.

The only common point between all the systems described or mentioned here is the **lack of resources** to develop more comprehensive data or to disseminate it. Therefore duplication must be avoided.

Also some new information systems or structures could be developed at Community level. For example the Foundation drawing from existing national questionnaire based surveys in Spain, Denmark and France has designed a **European questionnaire based survey** to a sample of 12.000 workers in the EC, which will be implemented in 1991. The survey is based on the idea that national methodologies and indicators being very similar, a common core of questions to these national questionnaires could be developed and implemented at EC level.

Again here we have a few questions to put to you:

- has any effort to be put in harmonising data collecting? If yes to which extent and how?

- do you think initiatives such as the European questionnaire based survey the Foundation intend to carry out might enhance comparability of data? Should such an initiative be pursued?

PANEL DISCUSSION:

Needs for monitoring systems and suggestions for the future

Chairman: Prof. Jacques Allegro
Director, Nederlands Instituut voor
Arbeidsomstandigheden, Amsterdam

Members: Stephen S. Hughes, M.E.P.
Durham and Blaydon European Office,
United Kingdom

Ronald Haigh
Director Industrial Medicine and Hygiene Unit,
DG V, Commission of the European Communities,
Luxembourg

Marc Sapir
Director, European Trade Union Technical Bureau
for Health and Safety, Brussels

Dr. Ted F. Thairs
Deputy Director, Employment Affairs
Confederation of British Industry, London

John F. Carroll
Member of the Economic and Social Committee,
Brussels

The following papers came out of a direct transcription of the panel discussion which ended the Conference.

The panel discussion was animated by Prof. Jacques Allegro from the Nederlands Instituut voor Arbeidsomstandigheden (NIA), Amsterdam.

The participants to the panel are representing various policy-making organisations at Community level. As policy-makers they were asked to answer the following questions:

1. What are the information needs policy-makers have ?

2. What do you suggest for the future in order to improve data collecting, data assessability, etc... ?
   And how do you achieve it ?

3. Who should be carrying out those tasks, who should coordinate it ?

Mr. Stephen S. Hughes MEP

You have had 2 days of deliberations on this very important topic and it is a very important topic from my point of view. I am a member of the European Parliament Social Affairs, Employment and Working Environment Committee and specialise within that Committee on the issue of health and safety legislation.

We have had a very heavy legislative work load in the health and safety field within the European Parliament over the last two years and have a great many more proposals to deal with over the next 2 before the end of 1992. We have had the Framework Directive, and the range of "daughter" Directives following on from that, including those on display screen working, personal protective equipment, machine safety, all major issues in themselves. We now have further proposals on, for example, construction site safety, the offshore drilling industries and onshore quarrying and mining. Quite a range of very important issues, and it's clear that, with such a wide range of issues and the tight timetable the Parliament is required to work to through the cooperation procedure laid down in the Single European Act, the Parliament and parliamentarians working in this area need access to a data base which will provide the information they need to make informed decisions during the crucial amending stages.

I have to say that that is not always possible. I have had to strive myself to establish a range of links, not least with the trade union movement, to establish contact with experts in the field, working in particular sectors, who can feed detailed commentary and proposed amendments to me. Beyond that there are of course a range of other sources of information. We have the Dublin Foundation, the European Commission, Eurostat statistical series and special editions, and also the Parliament's own directorate general for research and information. A wide range of information sources, but quite disparate. There have been occasions when, in fact, information we have required in our deliberations on certain of the proposals I have mentioned, have simply not been available.

One other point I should mention is that the Commission itself, I am certain, has access to a wide range of information. It is obliged under the questioning procedure in Parliament to provide information to the Parliament if it is available, but I am quite certain, from the explanatory memoranda which accompany the Directives, that the Commission is not always completely forthright in providing all of the information available in a given field. There are exceptions: the proposal on working hours, for example, has a very extensive and very expert explanatory memorandum providing a range of comparative statistics to justify the stands taken in the proposal. But that is not always the case, and it is in issues and in situations like that, that information becomes a political issue. Information is power and it's easier to justify a particular position if the information used to arrive at that position is denied to those who might otherwise be equipped to arrive at alternative conclusions.

In this way, the Parliament is often at a disadvantage in terms of relationships within the cooperation procedure at European level.

I think also, though, that there might well be a lack of information in certain spheres in general and this might in part explain the European Commission's own forward action programme. I think many people have commented that the Commission's own forward action programme does not seem to be in any way coherently prioritised. Profoundly important topics are interspersed with trivial issues in seeming random order. We, in the Parliament, have called, for example, for additional proposals on repetitive strain injury and on stress related illness and it seems that information in those areas is not available.

Going on from there I can mention specific areas where we have recently required information and where it has been available only in part or not at all. For example, the need for comparable statistics on the working week and shiftwork patterns; industrial diseases; industrial accidents by cause and effect; illness; mortality by age groups; industrial related genetic birth problems, for example in relation to nuclear workers, accidents in accordance with hours worked. There seems to be a sparsity of statistics in there and other areas. Also the relationship between wage levels, hours

worked and accident levels, there is a logic at work there, which might suggest that low wage levels will force people to work longer hours which can lead to fatigue and increased accident rates.

These points, I hope, illustrate the range of types of problems we have had in the Parliament in terms of access to information.

For my own part, I think that a combination of questionnaire based surveys together with accurate accident reporting, comparable accident reporting from around the Community countries could help establish the sort of data base we do need.

In terms of who should be in charge of coordinating that information, it is vitally important that all of these disparate strands are pulled together. It is clear that we need an agency which will be responsible for providing comparable statistics and also examples of best practices to allow a cross-fertilisation of ideas within the EC and to feed into the policy-making process. Now there is a proposal for the creation of a European Agency on Safety and Health. For my own part, I think that a lot of the needs I have outlined could well be met by an organisation like the Dublin Foundation, and I would hope that the work the Foundation has done to date can be examined, can be seen to be in fact directly relevant to the list of needs I have outlined, and perhaps the work that is done here can be incorporated in some key way into the establishment of that new agency.

I personally, Chairman, would like to see it go beyond that, but I think it would be a useful start in allowing as to have that sort of comparable analysis available at a one stop location.

Thank you.

Mr. Ronald Haigh, Director Industrial Medecine and Hygiene Unit, DG V/E/2 Commission.

As I have already intervened during the general discussion on a technical basis in response to certain questions. I do not think it is necessary to repeat myself. This will make my contribution shorter than intended.

The information needs for the Commission are the same or similar to those which Mr. Hughes has identified. We need to have proper base-line information so that we can take the appropriate decisions. Not only do we need the information which may be obtained from databases but, as I pointed out earlier, databases should provide information in a user-friendly and digestible form.

I think that if I am going to say any more than I said earlier, it should be that the information needs of a policy-maker is more that just data thrown into databases whether or not these bases are harmonised.

What might we suggest for the future? I think that the Foundation has done a good job in preparing a catalogue; however, I would have liked perhaps to have seen it looking a little further afield. I did mention that I thought they missed some areas and, I believe, other speakers have said the same thing. However the catalogue will supply a useful background and basis for further work and can be updated. It is necessary, for the future, to think what can be done with these data to enable the answers to the first question to be properly made and some of the ideas mentioned earlier on picking identifiable areas or choosing specific topics might be the way to educate ourselves on how to work together at European level. In this way we can apply what is available rather than going on creating more and more catalogues which we can not actually use very well because we are not all experts on all the subjects.

I think the Commission has a role to play in this. I think that, sometimes, we are thought to have more information than perhaps we have. We have a role to play to help people, and that role includes explaining to people what exists. I was struck earlier by the lack of knowledge on what actually

exists at European level in statistical offices or what exists in our work programmes. We are already working on accident statistics and we are hoping to work on statistics on diseases. There is a classification of industrial diseases in the Commission Recommendation. There is a whole series of activities which exist and which can be built upon. I think sometimes during the last few days some of these activities were forgotten. Perhaps the fault is with the Commission which has an exercise of education to carry out to explain to people what is already available.

Who should be carrying out these tasks? Experts should carry out the tasks. The only way we can get information in a usable form requires the availability of that data. It then requires the expertise available in whatever area you are looking at to turn this data into information. We heard about agencies, we have heard about the possible roles of the Foundation, or about experts acting privately. However, the people who are carrying out the tasks of collecting the information should be those who know what they are talking about, so that when the information comes to be digested by the policy-makers, it is intelligible.

Thank you.

Mr. Marc Sapir, Director, European Trade Union Technical Bureau for Health and Safety.

The first point I would like to stress concerns the needs for monitoring systems in Europe. It is clear that if we concentrate on the role played by public authorities at the Community level, what we want mainly is a public debate in the Community. I think it is essential for the European Parliament to play its role and proceed democratically. But what we basically need is a real democratic debate at a European level. We need to have certain data and the information to supply for this European debate. And I think we can see that in the future we have got to modify the Treaty and give a more important role to the Parliament. We have got to provide the fuel and ammunition for the debate.

Then there is a question of priorities. We have often stressed this question: how to identify what has to be done at European level, what is the most relevant and what could the European contribution be. There is also the question of the application of the Community directives. You will recall that the implementation by the Member States of legislation is a "confidential" process. It is only when it goes up to the Court of Justice that it enters the public domain and therefore the information for a democratic debate in the Community is an essential question. And on the application to the work place my colleagues already talked about the labour inspectorate but there is an enormous need for data. We are only at the start of filling this gap.

On the question of information, there is a point that strikes me very much. One has to recognise that you have got to collect and circulate information I think we realise that when you are talking about the company, the stage of actually collecting information is crucial. Very often this is the hardest action of all. That is the starting point. In a lot of countries this starting point has not always been achieved. We are not just talking about collecting information on technical facts but the actual practice of the workers, how the workers use the products, what really happens in the companies, that I think is an essential aspect.

Instead it seems that if in the future we want to have products and work places that are truly planned from the very outset to include the aspect of health and safety at work, I am not sure that the data bases as conceived at present, enable one to really fulfil the task to involve planning of work, planning the organisation of the work, to anticipate the problems. I think normally any intervention shows that one is obsessed by the cause. You want to prove that somebody is responsible, and I think that when we are talking about technological evolution this is a dead end. We are in a pluri-causal world, there are more and more causes, a multi-causal world.

Instead of looking for causes one should foresee and anticipate. We have so much data now that I think that is the line we should be adopting.

My last point would be: Who should now act? I think that it is really extremely urgent for the Community to act on products. The Commission really does have a responsibility here, not just to make a political statement, but there are directives that have been adopted and there are things that should be done immediately to set up a real system for collecting information. I would like to congratulate the Foundation in Dublin for making this initiative, which I think is of capital importance. I support the proposals made by the Foundation of having a survey and to develop the relevant indicators to identify priorities in the work. I think a lot of people have said they have tried to identify a certain number of themes which should be looked at by different institutions that are represented here, all those are important stages. The role of the Commission and the Foundation should be to coordinate, but there is one aspect we have not talked about very much, and that is the idea of complementarity. A lot of things have been done in different countries, there are perhaps bits missing from the jigsaw, and I think we have to develop coordination and dialogue between different countries, and there I think the Community can throw in an other dimension and that is a dimension of dialogue and complementarity.

I would like to conclude by thanking the Foundation in Dublin once more for having organised this work, I think this is crucial for the development of the social dimension in Europe.

Thank you.

Dr. Ted F. Thairs, Confederation of British Industry.

I would like to start by setting out the health and safety of a responsible employer.

The first is to provide a safe working environment. It was the Director of the Norwegian Employers' Organisation who said "if you think safety is expensive, then try an accident". The philosophy of safety prevention is what UNICE advocate.

The second objective is to protect all those affected by work activities: engineering controls in themselves may be inadequate but clearly they are the first port of call. If they are inadequate then there must be proper training, there must be reduced exposure in other ways, by the use of personal protective equipment and so on. And of course the problem must not be transferred outside the factory gate.

And the third objective of the responsible employer is to make sure that he obeys all the laws, including the Common Law, duty of care, including the requirement to provide information to the control authorities.

At the end of the day, a company safety record will be determined by the company itself. The readiness of employees to report on safe practices and conditions, the willingness of managers to plan ahead, to put suitable remedies in place. But there is also a need for external information sources especially directed at the above objectives. The first is that there is clearly a limit to the resources which are available and these should be directed where the perceived risk is the most serious, where the need is greatest and where the benefits are the greatest. So, we need to look to identify hazards, clearly product registers are useful here. We need to have a sense of prioritisation, so accident statistics, attitude surveys and so on are valuable. We need to consider prevention - we have not actually spoken in any great detail about prevention measures - but encouragement by example is very important so we could do with a catalogue of good case studies. We also need to know what equipment and fail-safe systems are available and the conditions in which they can be applied. And we need to

know the legal demands. Industry is international: it operates across borders even if it is not located in many countries. Its products certainly stretch out to markets across the world. So we need to know what the standards are in the various markets where industry operates.
I think we have already said enough about the conditions for using data bases, reliability of data, clear access and so on.

Coming to the improvements needed. The first clearly is better coordination. There is a great deal of information available, it is not always in digestible form and it is not always easy for industry to identify what it needs for meeting the objectives. Second, we need a better focus. I think it is obvious academic research is useful, but we have to bear in mind that what we are talking about is occupational health and safety and therefore the information should have a real application in the work situation. Third, I suggest that we actually need to get down and define a set of principles about the quality of the information, how is the information validated, how should it be communicated and at what level.

On the question of who does what I think that the European Foundation has, by organising this conference, clearly shown its credentials. I must just put in the question mark about the European Health and Safety Agency, because I am not entirely sure what that is intended to do and how it will relate to the Foundation in the future.

Thank you.

Mr. John F. Carroll, Member of the Economic and Social Committee

Mr. Chairman, I brought two hats with me, one that of an Irish Trade Union official, and the other that of a member of the Economic and Social Committee of the European Communities. Mr. Hughes here, speaking for the European Parliament Social division, has said what I could have said about the Economic and Social Committee's Social section of which I am the outgoing Chairman, because we have all the needs he expressed in the way he expressed them; so there is no need for me to repeat what he did say. I am going to take advantage of that to make a few points as an Irish Trade Union Official which I think may have some relevance also to the broader question of monitoring.

When we talk about monitoring, compiling records and evaluating the records and the type of exercises that are involved in that, I think we have got to be extremely careful that this exercise does not assume greater importance than the purpose of the exercise. I accept that the exercise is essential but academic pride will not replace practical measures of primary prevention which I think must receive a higher priority by all of us. That refers also to the question of monitoring in a very broad way.

I do not believe that enough has been done to understand the impediments which have to be overcome to have the most effective primary prevention programme or approach to the whole question of health and safety. I could not deal with that myself here, even if I had an hour to cover the topic, but there are a few points that, I think, must be made.

First of all from a Trade Union view point, there is no value in having all the material on paper or in data bases if the Trade Union movement at national and international level has no access to that material. We do not want to be preached at nor talked down to. We are participants or should be in a total sense, and we can only play our part if we are consulted from the bottom up. And that means workers who have to work the equipment, the systems or the machines, have to be given a say when it come to devising and even siting and using the equipment. And against that background we must remember that one of the major barriers to be overcome in an effective

monitoring system, which is only as good as the actual monitoring process it is involved in is, is why are worker at times so opposed to what appears to be something in their own best interest, the prevention of accidents and so on. We ignore the fact that there are major economic and social problems. If a worker is involved in a process which gives to him a particular bonus, he will cut corners unless he is assured that the structure of his reward for his input is so that he can still get an adequate return for his labour. If he has to cut the corners, as unfortunately it happens, then inevitably an accident will result. And the employer will be penalized by that as much as the worker. But we also forget that there are happenings now in the family area, socially, which impact on the individual's attitude in his workplace and that makes him not alone fatigued but maybe stressed mentally or otherwise which takes away his attention at a crucial point in an operation.

And when I say we do not understand enough about the barriers or the impediments to be overcome in getting adequate knowledge, we do not do very much about examining the inter-relationships between the job climate and the family climate. The worker may bring problems home with him, the stress and tension which impact on the family, cause tension which can cause illness, cause pressure on the social welfare system, and vice-versa, the family problems, bad housing, inadequate or bad diet, all the things which can create a problem for the worker in his own working environment. We need a lot more information and knowledge about these matters so that when we come to devising strategies to prevent accidents and to prevent ill-health or to enable people to be more healthy all the time, we can really do something that the Trade Union movement can play a more effective role in by way of supporting cooperation.

Thank you.

Prof. Jacques Allegro, Nederlands Instituut voor Arbeidsomstandigheden.

I will now give a short summary of the main themes of the discussion, because there is no time left for discussion. My idea is that if the ultimate intention is prevention, there are two lines in the discussion. There is a clear need for more information. Information which has not been too detailed, if possible information which is standardized, which is coordinated and yet user friendly. That has been stated several times this morning.

At the same time several speakers have stated that there is a need for action, there is really a need for a lot of preventive measures. There has been spoken of a necessity of a need for a catalogue of solutions. In my opinion if we talk about solutions we have not only to talk about the end result, but we have to talk about a process too: how can we reach the solutions, what are the blocking and stimulating processes. One point which is stated by a lot of people here is that it implies a close cooperation between employers and employees. It can not be attacked only by one of the parties.

Discussing about the need for information, we have to talk about different levels. We have to talk about European level, national level and what is perhaps the most important that there has to be work done on the enterprise level. Because that is the level where ultimately the changes have to take place to get a more safe and healthy work place.

I then come to the last question we had in mind discussing in this panel. Who has to be active in the future, who has to coordinate. It is quite clear, as a number of speakers have stated, that the Commission has an important role to play and I thank the European Foundation for taking the initiative of having this conference, coordinating this problem. They can in my opinion play an important role in the future!

Thank you.

CLOSING REMARKS

Eric Verborgh

Deputy Director
Foundation

Having reached this stage after two very dense and valuable days of work I am afraid that if I tried to draw conclusions I would only be repeating things that have already been said. I therefore think it more important to bring our work to a close and to indicate certain issues for a new debate, for a follow-up to our discussions.

The Foundation is an European body, public, open and transparent and one of our practices is to have our work and our studies confronted with the views and expertise of practitioners, decision makers, social partners, researchers and experts. This is the exercise we have embarked upon in having this conference; it enabled us to assess the strengths and weaknesses of the tools currently available and it also enabled us to gain information on improvements to be made in the future.

The catalogue that was presented to you at the beginning of the conference is not an end in itself, it is only an initial stage in a process intended to lead to better information systems on working conditions in the whole of the Community. It has already been said that we want to gather information, to coordinate it, to harmonise it in such a way as to ensure that this knowledge can be reflected as effectively as possible in practical action, particularly in companies. I believe it important to remind you that we do not try developing these tools in order to compare for comparison sake what is done in one country to another. We try to draw on existing experience to see what is best in their system in order to improve working conditions within the Community.

The first result we have achieved is the pooling and putting together of a certain number of experts, in particular practitioners using national systems. They didn't necessarily know each other before; everybody here can now more easily have access to the practices and the methods developed in other countries. This is a first step, but certainly not the last. In the context of our current programme we already have in hand for next year to improve and refine our tools and instruments, to update them, to complement them with other interesting systems. We are going to have a feasibility study on the computerising of the catalogue and we very much hope that in the course of next year we shall have the first European Survey on Working Conditions in the European Communities.

What we have done so far and what we intend to do in the future is of course undertaken in cooperation with the different services in the Commission, dealing with these problems. For more than a year now we have been developing very close cooperation with them, and we shall continue to do it. We shall also continue to ask experts and representatives of the social partners to look very closely at the work we are doing.

I would now like to express my thanks to all the people who have participated in this conference, some of them having come a very long way, and contributed to the success of these two days of work. I would particularly like to thank those who made presentations, particularly the national systems. I think we had a very fruitful afternoon yesterday, and in the number of hours spent, a great deal more than a half day work. I would also like to thank our colleagues who prepared the work for the Foundation, particularly the summary report. It is of course my pleasure to thank Henrik and Pascal and their secretaries, who for many months now have been working at this conference ensuring that it ran smoothly and effectively.

Thank you very much; this concludes the conference.

SUMMARY AND CONCLUSIONS

Henrik Litske
Pascal Paoli

Conference on Systems for Monitoring working conditions related to Health and Safety in the European Community

Dublin, 15-16 November 1990

The conference organised by the European Foundation over 2 days (15-16 November 1990) brought together 85 people from the 12 EC member states, as well as participants from Sweden, Finland, USA, Hungary and Czechoslovakia, and participants from international organisations (ILO, WHO, OECD) and EC institutions (Commission, Parliament, The Economic and Social Committee). Both sides of industry were also represented.

European Data Bank

On the first day the new data bank on monitoring systems in the Community,which the European Foundation has set up, was presented. The data bank will be computerised in the near future and a regular updating is foreseen.

Its aim, as it was explained, is to facilitate identification of relevant information sources on working conditions related to health and safety in the various Member States. The main characteristics of each system filed in the data bank are described.

The genesis of this data bank lies in the difficulty at the present time to assess the state of working conditions related to health and safety in the Community. Either the information is lacking or confidential or it cannot be utilized for prevention, or it is not homogeneous. A great number of monitoring systems have been set up: occupational accidents and diseases reporting systems ; registers on products and substances ; registers on exposures ; questionnaire based surveys.

But quantity does not necessarily ensure usefulness, comprehensiveness and comparability. In particular at international level the methodologies and the indicators chosen might offer little basis for comparison between countries, sectors or categories of the workforce.

Variety of monitoring systems

A variety of monitoring systems were presented (see detailed description next pages) so as to exemplify and illustrate the various categories of existing systems:

- register on products and substances,
- register on exposures,
- questionnaire based surveys,
- mortality surveys,
- occupational accident and diseases reporting systems.

Each time both the methodology and the information output were described.

These descriptions highlighted a number of facts:

1. The **very wide range of existing instruments** for monitoring working conditions throughout the Community.

2. The **development of new monitoring systems,** in particular those based on questionnaire surveys (France, Germany, Spain and Denmark and the other Scandinavian countries have such questionnaires). The survey can be based on interviews or they can be postal surveys. The technique is to develop a questionnaire which makes it possible to describe the national working conditions as accurate as possible.

3. **Improvements in reporting systems on accidents and diseases are needed.** Analysis on occupational accidents and diseases can be a powerful instrument for preventive purposes if the reporting systems are designed correctly. The Swedish system is particularly representative of this, as it offers practical information to companies.

Policies for the future

The discussion on the second day was centred on two major questions:

- what kind of information policy makers need or wish to have, in particular at Community level (Commission, Parliament, The Economic and Social Committee) ?

- what king of monitoring systems are able to best answer these needs, or should be setup to answer these needs ?

In order to support the discussion the Foundation had commissioned the Nederlands Instituut voor Arbeidsomstandigheden (NIA), Amsterdam, to make an overall assessment of the existing monitoring systems described in the European Foundation data bank and to help contribute to the establishment of more consistent indicators at Community level. (See consolidated report).

A number of conclusions came out of the debate which took place between policy makers and experts. They do give a number of clear indicators on possible steps to be taken in the future. Among other points we selected the following:

- **setting up a data bank of monitoring systems**, like the one set up by the Foundation, is vital. Furthermore such a data bank should be more comprehensive and regularly updated. It is a first step to foster exchanges and collaboration within the Community.
Representatives from Sweden, Austria and Czechoslovakia suggested including their countries in the data bank.
But such cataloguing, though necessary, is not sufficient. A more proactive stand should be taken. Suggestions were made to extend the exchange of information to the results themselves, at least on a limited number of key issues. The Foundation, or other bodies, have an important role to play here by setting up and coordinating networks on specific issues and between specific monitoring systems.

- **the democratic debate needs sound and comprehensive information.**
A number of participants stressed that point, notably from the European Parliament and from ETUC. Examples of issues where information was found lacking were: muscular-skeleton related diseases, differential mortality and fertility rates, or occupational accidents in relation with wage systems.

- it was deemed absolutely essential that the **information be made more user friendly**. In fact information generally exists. But either it is difficult to access (confidentiality) or, when accessible, is too sophisticated and therefore difficult to use. Data producers have to get more aware of who the users are, both at company level, and at macro level.

- as said above, information does not always need to be refined. But it certainly needs to be made more practical and **more oriented towards prevention**. Providing figures does not in itself enhance prevention. Preventors need information which can help them redesign workplaces. As one participant put it, it is time to move from primary prevention to secondary prevention and, therefore, more **soft information** has to be provided.

- **the monitoring of implementation** is also a key issue. It is particularly true regarding the implementation of European norms and directives, as more powers and initiatives are to be transferred from the national levels to the Community level. More **evaluation surveys** are necessary.

- as a complement to what has been said above, **catalogues of good practices** should be set up or extended. Preventers and policy makers not only need information on what should be done. They also need practical information on how to do it and how to manage change. Good solutions are indicative of what could be achieved. In parallel a strong focus should be put on the **processes** which are conducive to these positive solutions.

- an important obstacle, as mentioned before, to the dissemination of information is **confidentiality**, as in the case of products and substances registers. Though the problem was constantly raised, it was difficult to see how it might be overcome. But it highlighted the fact that dissemination of information is as important as the collecting of information.

- the Foundation presented its projects of a **European wide questionnaire based survey on working conditions.** The idea was widely approved as it could be a very useful monitoring instrument for Community institutions. It was also generally agreed that it should build on existing indicators used in national questionnaire based surveys.

- finally the conference insisted on the fact that **harmonisation of data systems** was not necessarily a priority. Harmonizing for the sake of harmonizing is a waste of time. But a minimum basis of common standards is necessary. This is especially the case for new monitoring systems being set up. A minimum of comparability and division of tasks should be ensured. For example, the Community could possibly accommodate 12 national product registers under the condition that information could be exchanged between the different registers. To sum up interconnection comes first to harmonization.

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